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TRANSPORTATION COSTS OF FOSSIL FUELS

INTERIM REPORT

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CONTENTS

	Page
Abstract	1
Introduction	2
Transportation of coal	2
Methodology	3
Analysis of data	4
Summary	23
Transportation of residual fuel oil	24
Methodology	29
Analysis of data	30
Summary	38
Transmission of natural gas	39
Analysis of data	42
Summary	44
Recommendations	45
References	46
Coal Appendix	48

ILLUSTRATIONS

Fig.		
1.	Cost per ton mile for coal shipped by rail from 18 coal producing districts by length of haul	5
2.	Coal producing districts in the United States	6
3.	Cost per ton mile for coal shipped by rail from various origins in Coal District 1 by length of haul	8
4.	Cost per ton mile for coal shipped by rail from various origins in Coal District 2 by length of haul	9
5.	Cost per ton mile for coal shipped by rail from various origins in Coal District 3 by length of haul	10
6.	Cost per ton mile for coal shipped by rail from various origins in Coal District 4 by length of haul	11
7.	Cost per ton mile for coal shipped by rail from various origins in Coal District 7 by length of haul	12
8.	Cost per ton mile for coal shipped by rail from various origins in Coal District 8 by length of haul	13
9.	Cost per ton mile for coal shipped by rail from various origins in Coal District 10 by length of haul	14
10.	Cost per ton mile for coal shipped by rail from various origins in Coal District 11 by length of haul	15
11.	Cost per ton mile for coal shipped by rail for minimum annual tonnage contracts	16
12.	Cost per ton mile for coal shipped by rail by minimum trainload tonnages	18
13.	Cost per ton mile for coal shipped by rail by car ownership	19

Page

Fig.
14. Cost per ton mile for coal shipped by rail to oven-coke destinations..... 20
15. Negotiated tanker rates from U.S. Gulf to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 1,800 miles..... 32
16. Negotiated tanker rates from the Caribbeans to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 1,800 miles.. 33
17. Negotiated tanker rates from the Mediterranean to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 5,200 miles.. 34
18. Negotiated tanker rates from Persian Gulf to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 12,000 miles via Cape of Good Hope..... 35
19. Residual fuel oil barge freight rates per long ton from San Francisco to inland destinations, 1970, for single voyages of the 1,300-3,200 long ton class size..... 36
20. Natural gas pipeline systems to the New York and San Francisco SMSA's, 1970..... 41

TABLES

1. Summary of Btu values and railroad transport costs for coal in selected coal producing districts..... 22
2. Residual fuel oil tanker freight rates per long ton, from specific origins to New York City, 1970..... 25
3. Residual fuel oil tanker freight rates per long ton, from specific origins to San Francisco, 1970..... 27
4. Residual fuel oil barge freight rates per long ton, from San Francisco to inland destinations, 1970, for single voyages of the 1,300-3,200 long ton class..... 28
5. Natural gas pipeline transmission rates to New York and San Francisco SMSA's..... 40
A-1. Bituminous coal received at oven-coke plants in the United States, 1969..... 49
A-2. Transportation cost characteristics of bituminous coal shipped to selected consumers..... 56

ABSTRACT

This interim report delineates some of the important factors relating to the costs of transporting fossil fuels from regions of production to sites of consumption. The costs of shipping coal have been presented in a quantified fashion for selected producing area to areas of consumption. The costs of shipping residual fuel oil and natural gas from domestic and foreign sources to New York and San Francisco Standard Metropolitan Statistical Areas alsc are provided. Transportation data were collected from published tariffs, transportation associations, and personal communication with railroad, electric utility, oil, gas, and coal company representatives. The data were stratified to determine the general effects stratification had upon transportation costs. Diagrams showing the various levels of stratification for the fossil fuels and the basic data from which the diagrams were derived are included.

Economies of haul for coal do exist for longer versus shorter distances, larger trainload versus smaller trainload sizes, and company-owned car ownership versus railroad car ownership. Most of the rates for the longer voyages for the tanker and barge transportation of residual oil also show economies of haul. No apparent economies of haul exist relative to volume and/or distance shipped for natural gas based on the data studied.

INTRODUCTION

The purpose of this report is to present a schedule of transportation costs for coal, residual fuel oil, and natural gas and to analyze the costs to reflect their significance. The costs analyses of coal transportation attempts to show the comparative costs of transportation between coal districts and points of consumption on a per ton mile basis. The transportation factors and comparative costs of moving natural gas and residual fuel oil are analyzed on a long ton mile and heat value basis. For purposes of convenience throughout the report, residual fuel oil will be referred to as oil and natural gas as gas.

The work was completed for and funded by the Office of Air Programs of the Environmental Protection Agency.

TRANSPORTATION OF COAL

This section provides an analysis of coal transportation data from points of production to points of consumption. The costs of transporting coal have been compiled, stratified, and regressed so that a meaningful analysis could be made of the data.

Methodology

Data were compiled that reflected the cost differences resulting from transporting coal from various origin points to consumption sites. Data were collected from Interstate Commerce Commission (ICC) tariffs, tables published by railroad associations, and telephone conversations with representatives of railroad and electric utility companies (tables A-1 and A-2). Table A-1 shows transportation characteristics of bituminous coal received at oven-coke plants in the United States. Data pertaining to origin and destination of coal consumed by oven-coke plants are accompanied by the characteristics of the resulting transportation charges. Table A-2 shows data for the movement of bituminous coal by railroad only to electric utility and cement manufacturing consumers. Origin and destination data of bituminous coal are accompanied by transportation rate data based on various conditions of haul.

Regression analyses were performed on a cost per ton mile versus distance basis. The data were stratified by coal district, size of trainloads, car ownership, and annual minimum tonnages in an attempt to reduce the variations of data points about the regression line. These variations are caused by different transportation parameters affecting each point in the scatter diagram. The problem of variation reduction has been a perplexing block to the meaningful analysis of the transportation data available for this study. Further stratification that what is shown by the 13 diagrams was desirable but not

possible because of the lack of data. The trade-off between variation reduction and the number of points remaining that represent a specific universe was too great; that is, the number of data points remaining were too small to make an adequate evaluation of the universe.

Several functions are presented on each graph so that the function which best fits the data points can be compared with other functions. The intercept, slope, and coefficient of correlation are presented with each function. The coefficient of correlation (r) shown for each function reflects the relative fit of the function in relation to the data points.

Caution should be taken when interpreting the coal diagrams. The regression equations and corresponding regression lines are presented only as indicators of possible tendencies within certain areas. Because a great deal of variation exists in most of the diagrams, the discrepancy between any actual rate within a particular coal district and the estimated rate may be large.

Analysis of Data

On most graphs three functions are fit to the data to see which best minimizes the variance about the regression line. Figure 1 is data plotted for 18 of the 23 coal-producing districts for which data was available. Figure 2 shows the 23 coal producing districts in the United States. The best fitting function is $Y = aX^b$ with an r of approximately 0.68. What seems to be reflected in the slope of the

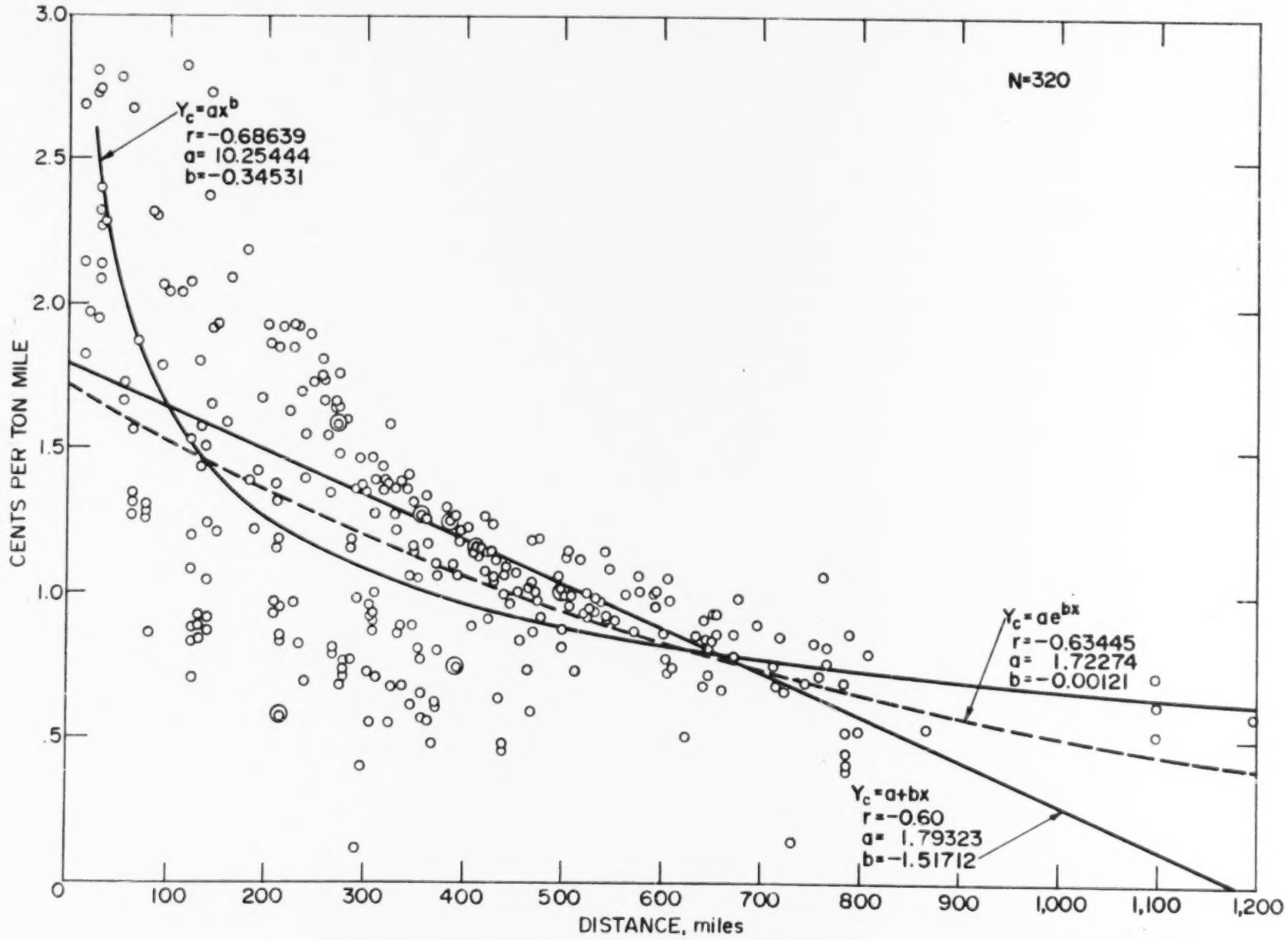

FIGURE 1. - Cost per ton mile for coal shipped by rail from 18 coal producing districts by length of haul.

FIGURE 2. - Coal producing districts in the United States.

regression line, is significant economies of haul, especially within the 0-500 mile range. Although economies of haul do exist beyond the 500 mile range, they are significantly smaller than those economies realized under 500 miles. An r of 0.68 could be judged good, when considering the heterogeneity of the arrayed data.

Figures 2 through 10 are data subsets of figure 1, stratified by coal producing district. In most instances, the best fit function for the individual coal district has a higher r than does the best fit function for figure 1. This would generally be expected since variation in data dispersion is usually reduced when more variables are held constant. In several instances the best fit regression line is linear because no data points were observed within the 0-100 mile range. However, the best fit regression equations in Districts 7 and 8 (figures 7 and 8) have a lower r value than the r for the 18 districts (figure 1). The lower r value for Districts 7 and 8 may be explained in several ways: the small number of observations in District 7, topography and location of coal markets, and train size and length of haul are all factors which may increase the variation.

Figure 11 shows data points stratified by minimum annual tonnages of coal shipped. The diagram shows on the average smaller costs per ton mile for larger versus smaller minimum annual tonnage contracts. The greatest economies of haul are again realized for all categories when the length of haul increases up to approximately the 400-500 mile distance.

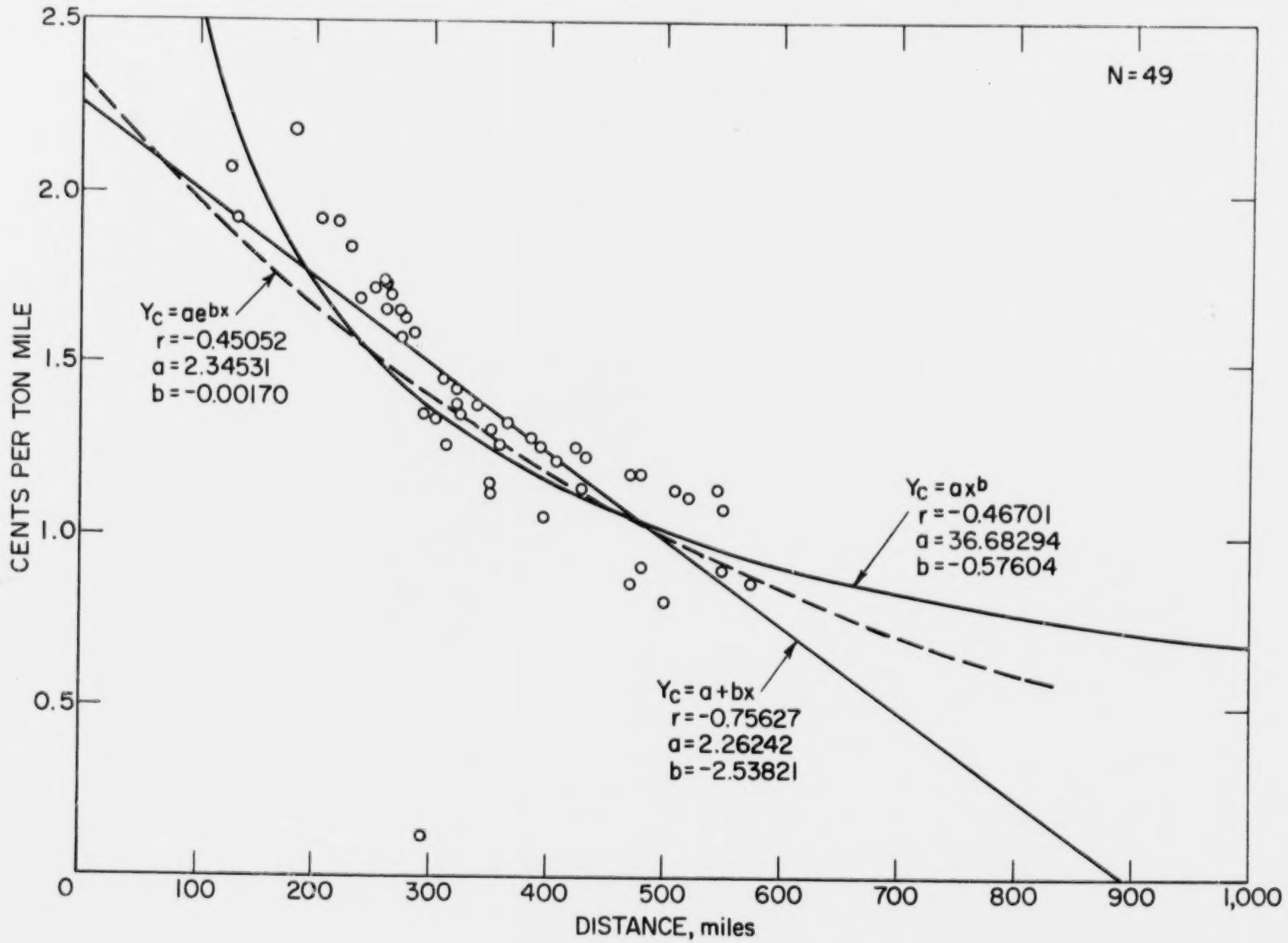

FIGURE 3. - Cost per ton mile for coal shipped by rail from various origins in Coal District 1 by length of haul.

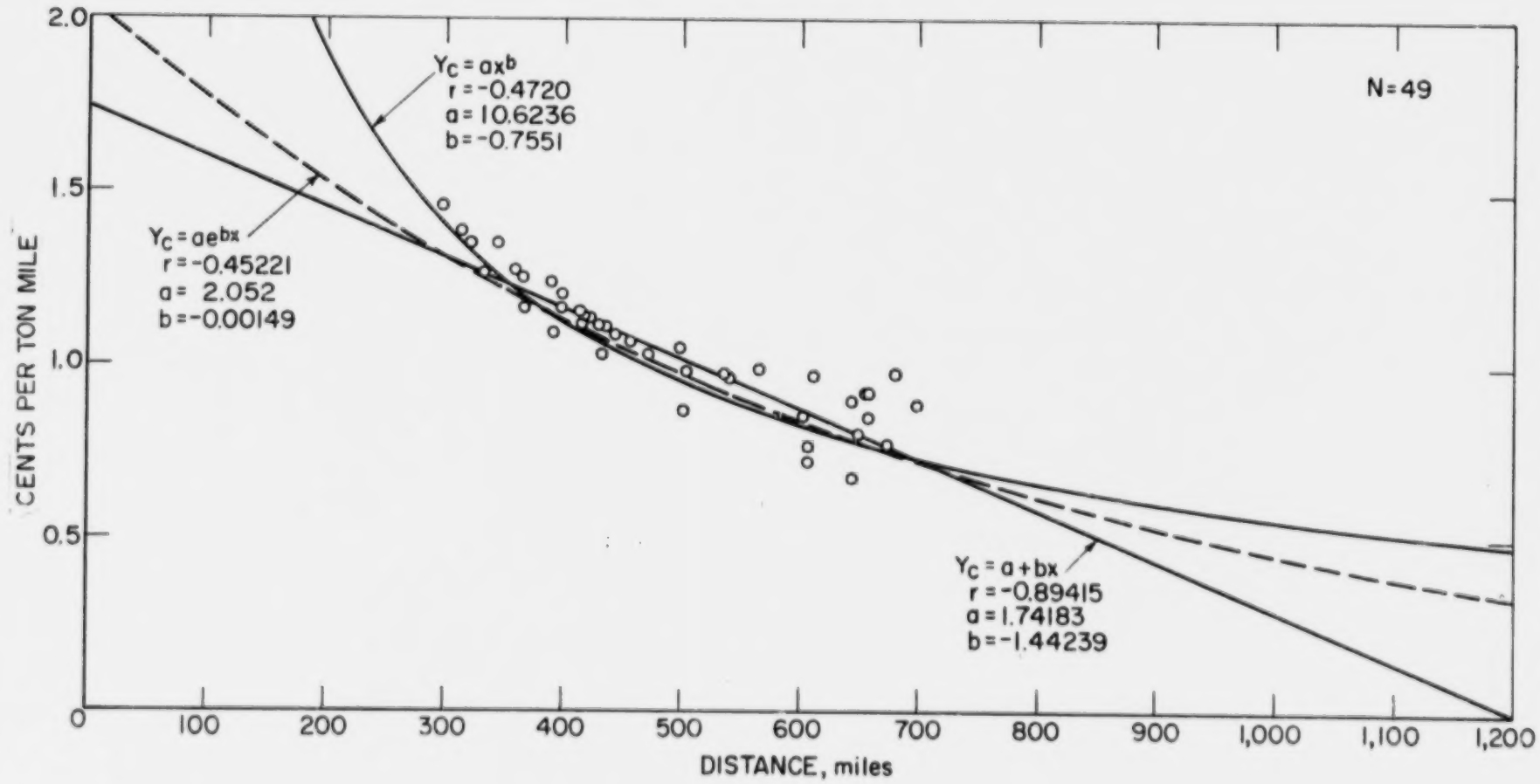

FIGURE 4. - Cost per ton mile for coal shipped by rail from various origins in Coal District 2 by length of haul.

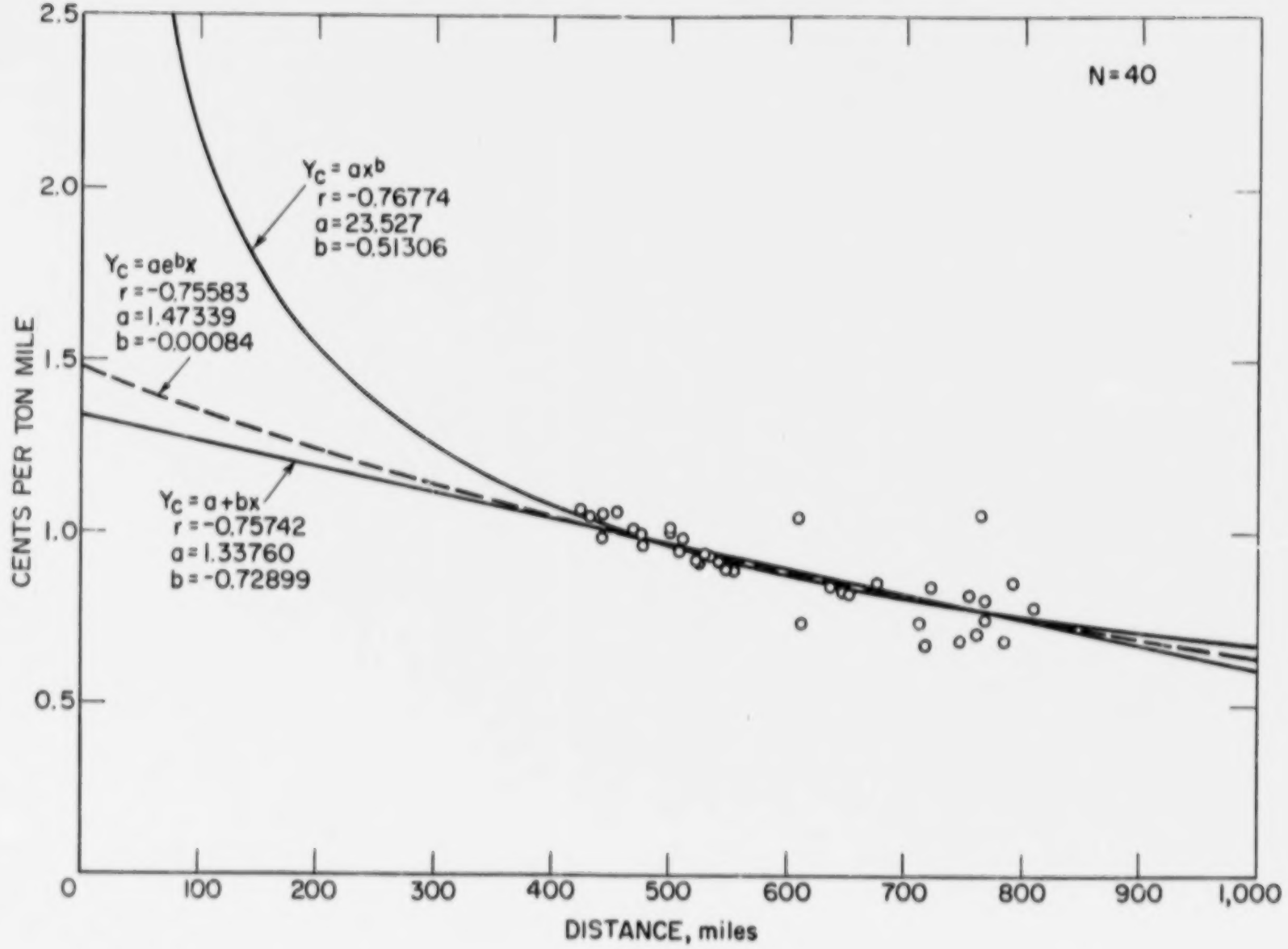

FIGURE 5. - Cost per ton mile for coal shipped by rail from various origins in Coal District 3 by length of haul.

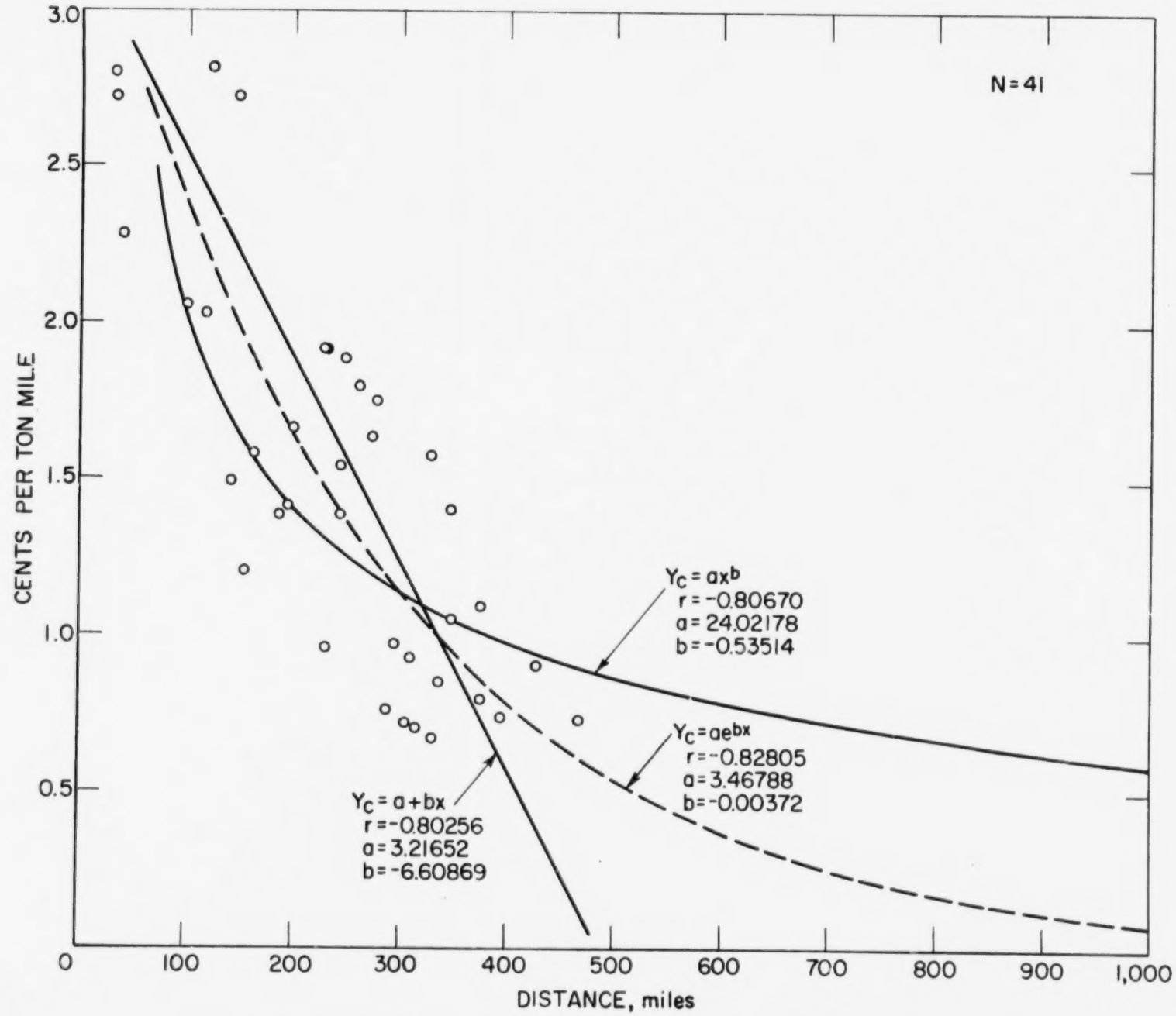

FIGURE 6. - Cost per ton mile for coal shipped by rail from various origins in Coal District 4 by length of haul.

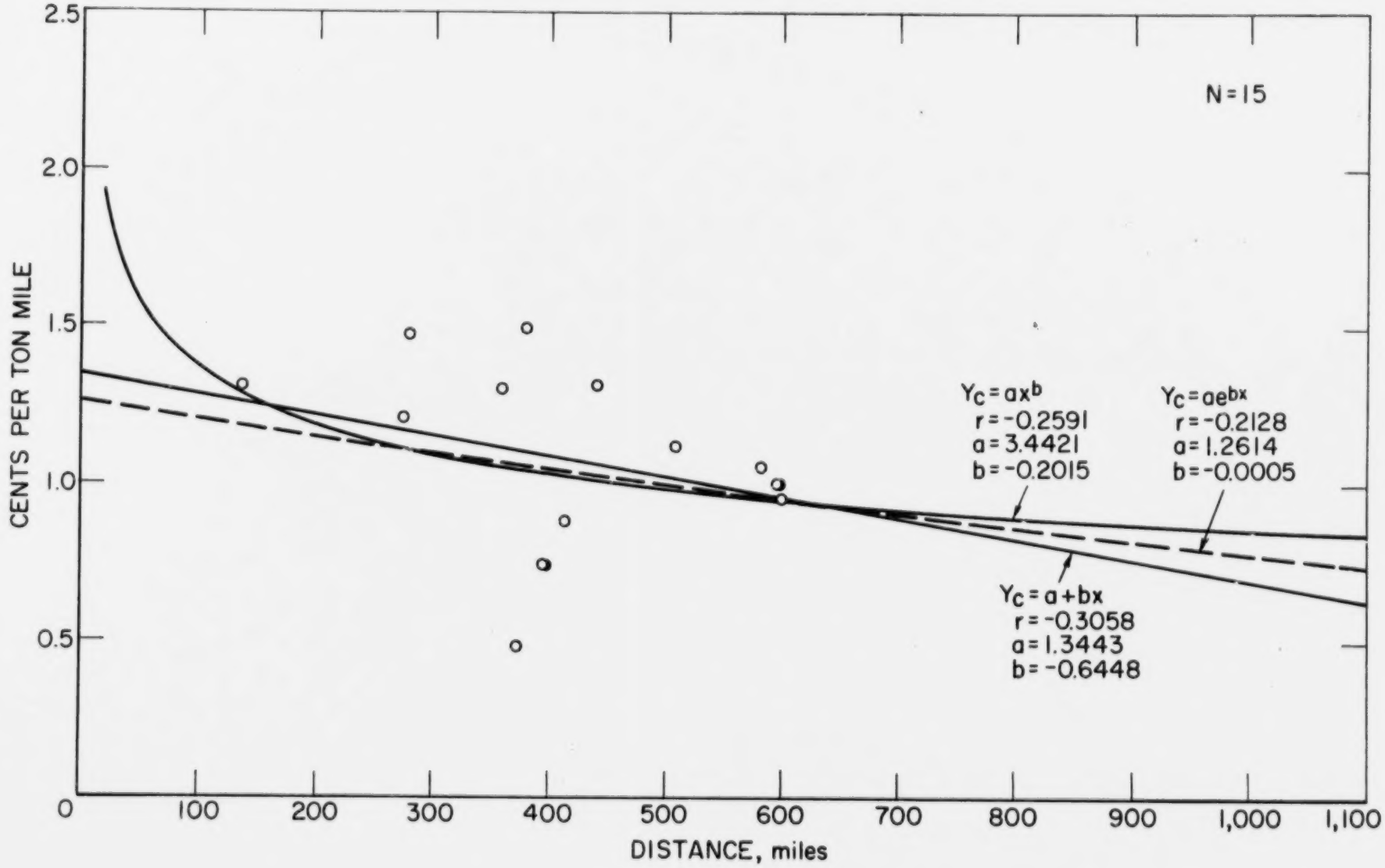

FIGURE 7. - Cost per ton mile for coal shipped by rail from various origins in Coal District 7 by length of haul.

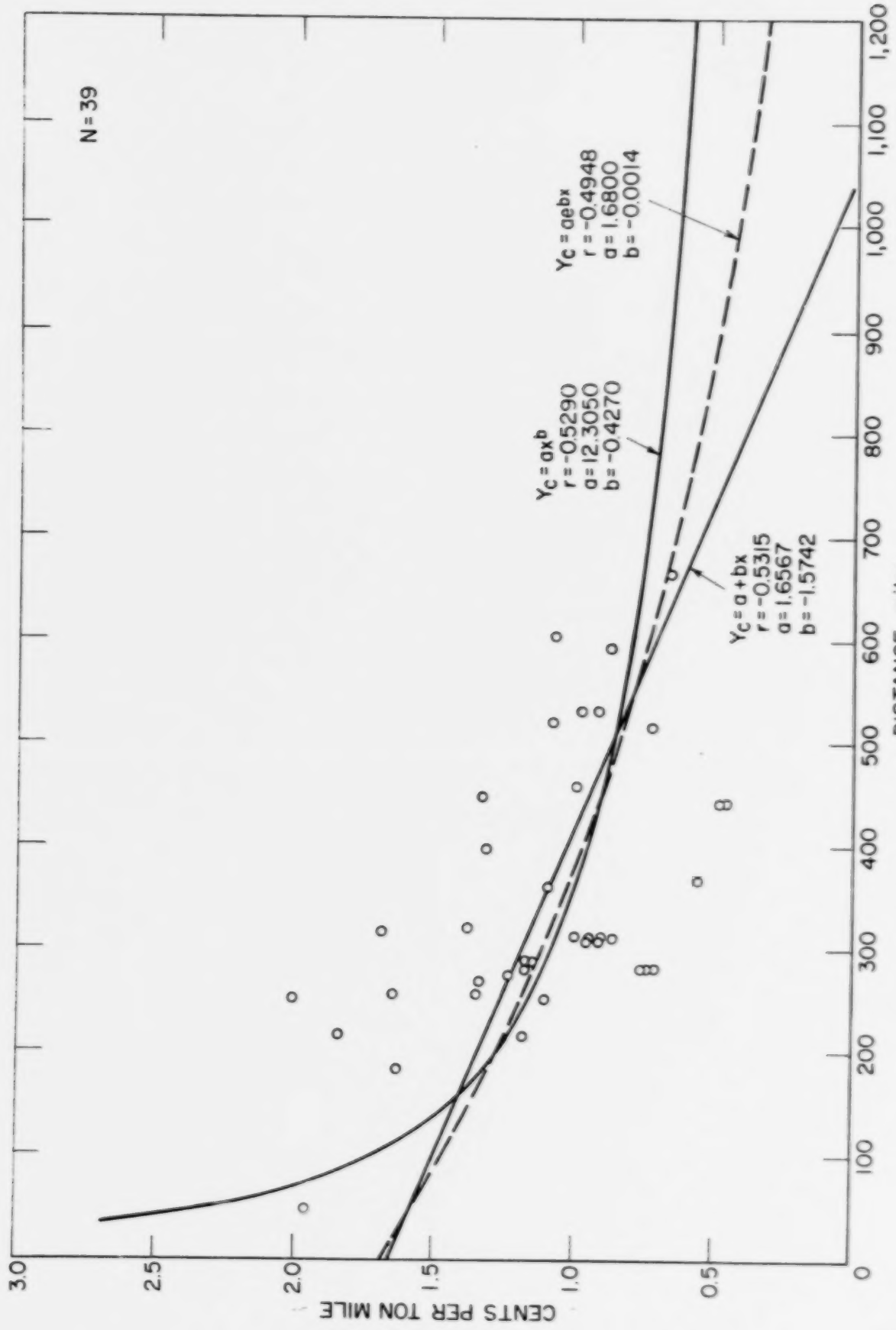

FIGURE 8. - Cost per ton mile for coal shipped by rail from various origins in Coal District 8 by length of haul.

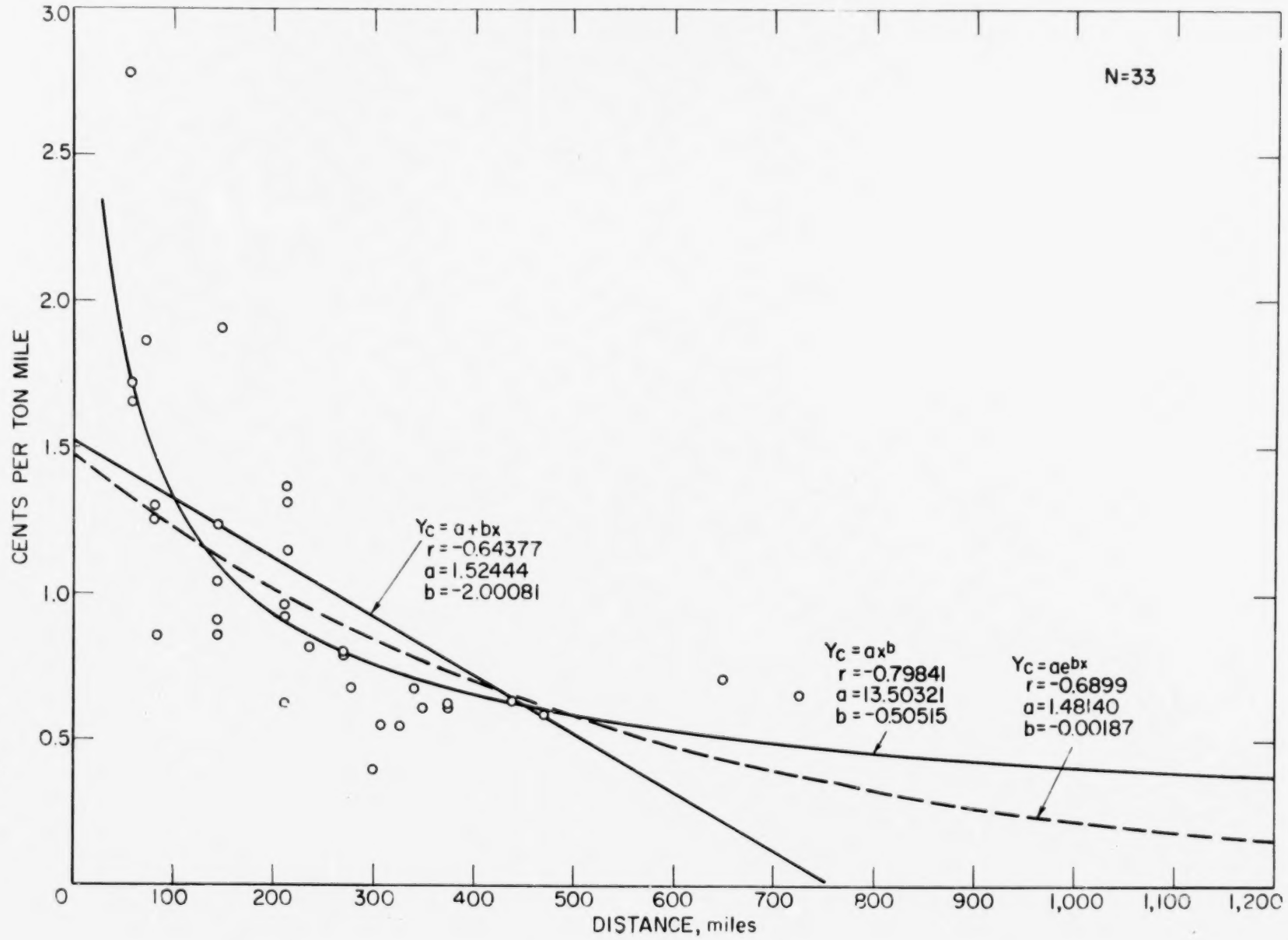

FIGURE 9. - Cost per ton mile for coal shipped by rail from various origins in Coal District 10 by length of haul.

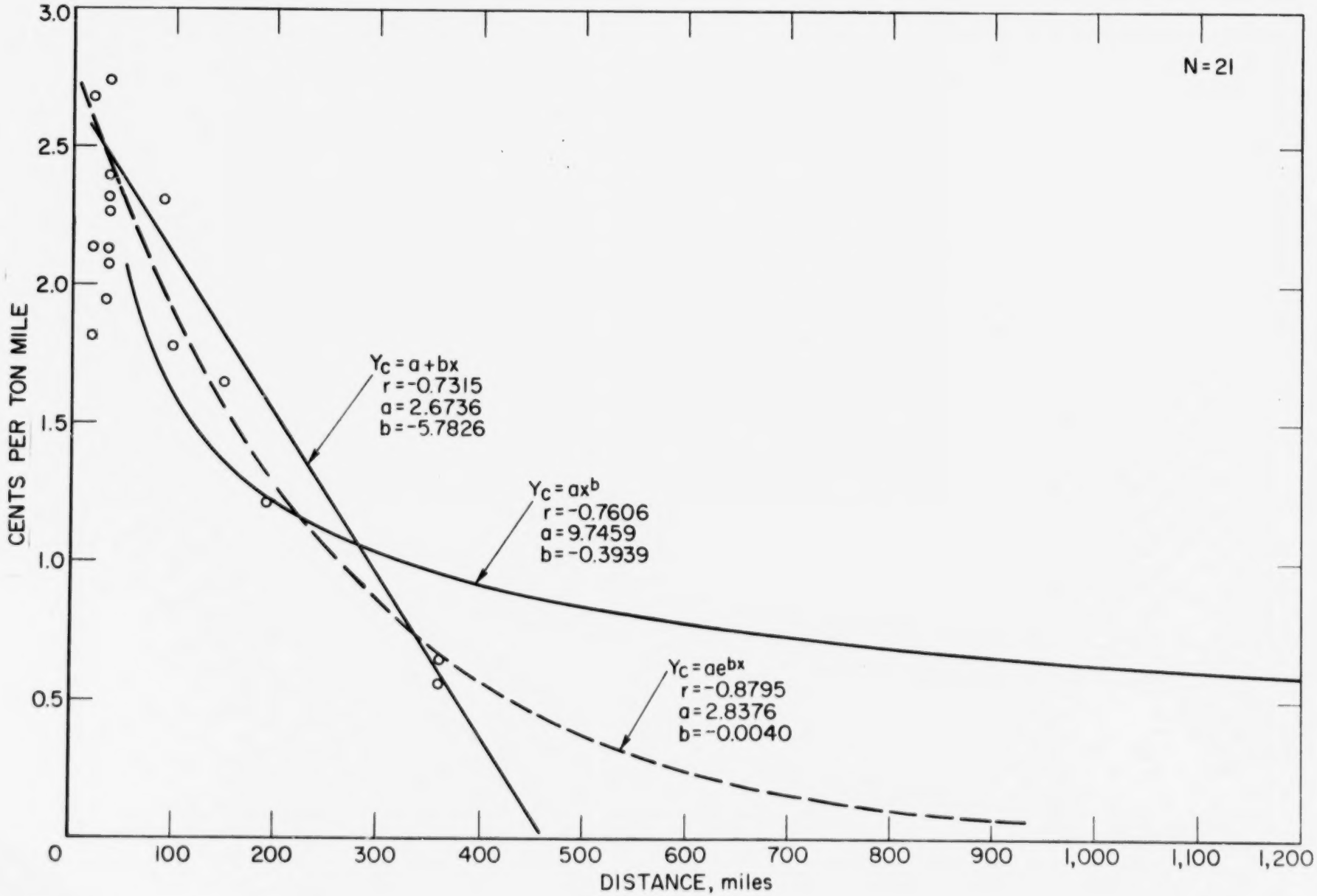

FIGURE 10. - Cost per ton mile for coal shipped by rail from various origins in Coal District 11 by length of haul.

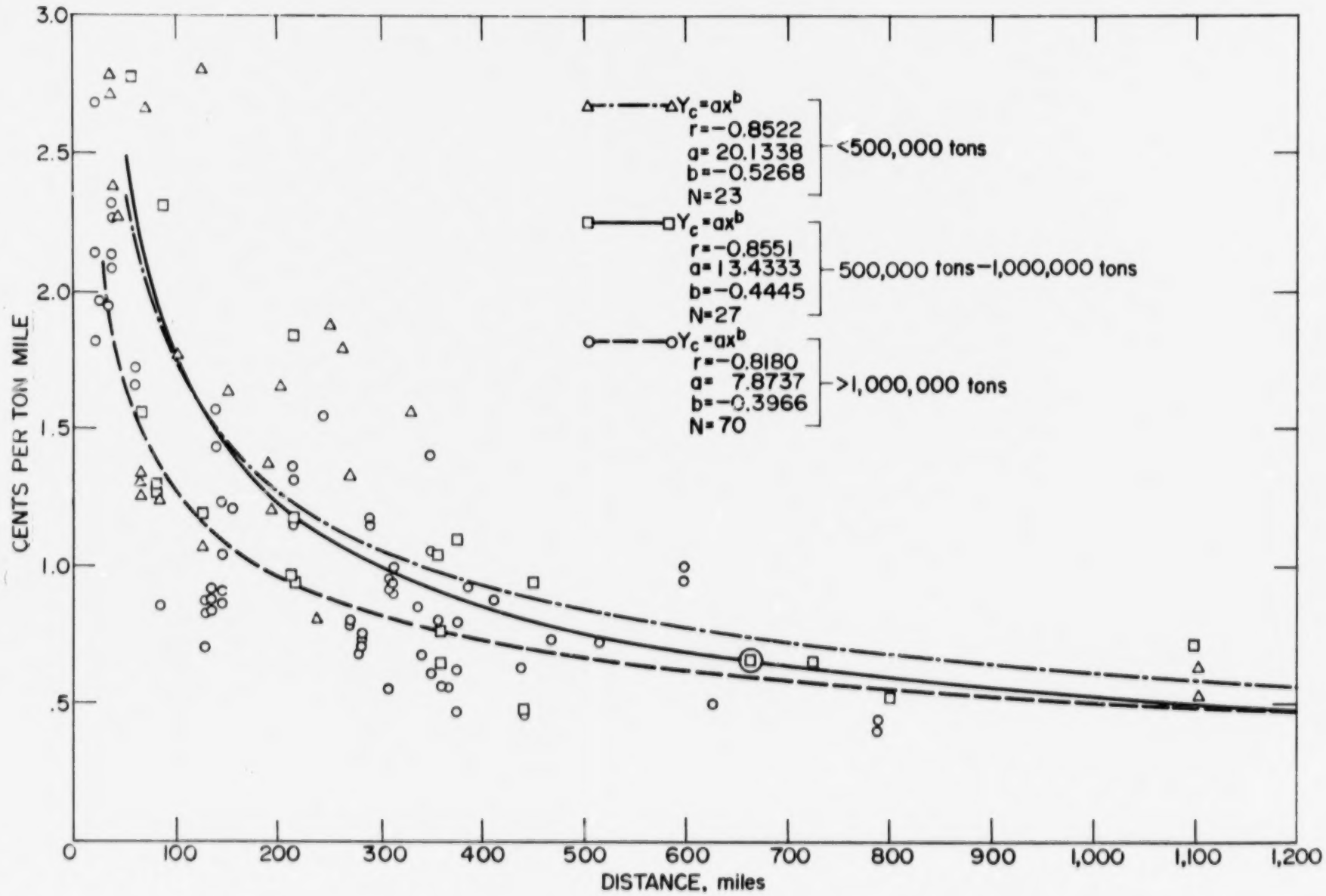

FIGURE 11. - Cost per ton mile for coal shipped by rail for minimum annual tonnage contracts.

Figure 12 shows cost per ton mile for coal shipped by rail by minimum trainload tonnages. The graph does not exhibit the expected economies of haul for trainload sizes. The middle class, on the average, shows the highest average costs of haul of the three sizes. This again may be attributable to too few data points. However, whatever the cause may be, without significant additional investigation it is only a matter of speculation.

Figure 13 shows that the shipper who owns his own cars pays less than when shipping by railroad-owned cars. The average distance between the regression lines is approximately 0.25 to 0.30 cents per ton mile. A greater savings is realized on the average than in figure 12 when coal is shipped by the largest rather than the smallest trainload size.

Figure 14 shows cost per ton mile for coal shipped by rail to oven-coke plants and exhibits approximately the same data dispersion pattern as that shown in figure 1. The regression lines on figure 14 are higher positioned (cost more per ton mile to ship) than those of figure 1, due to higher overall transportation rates for coking coal.

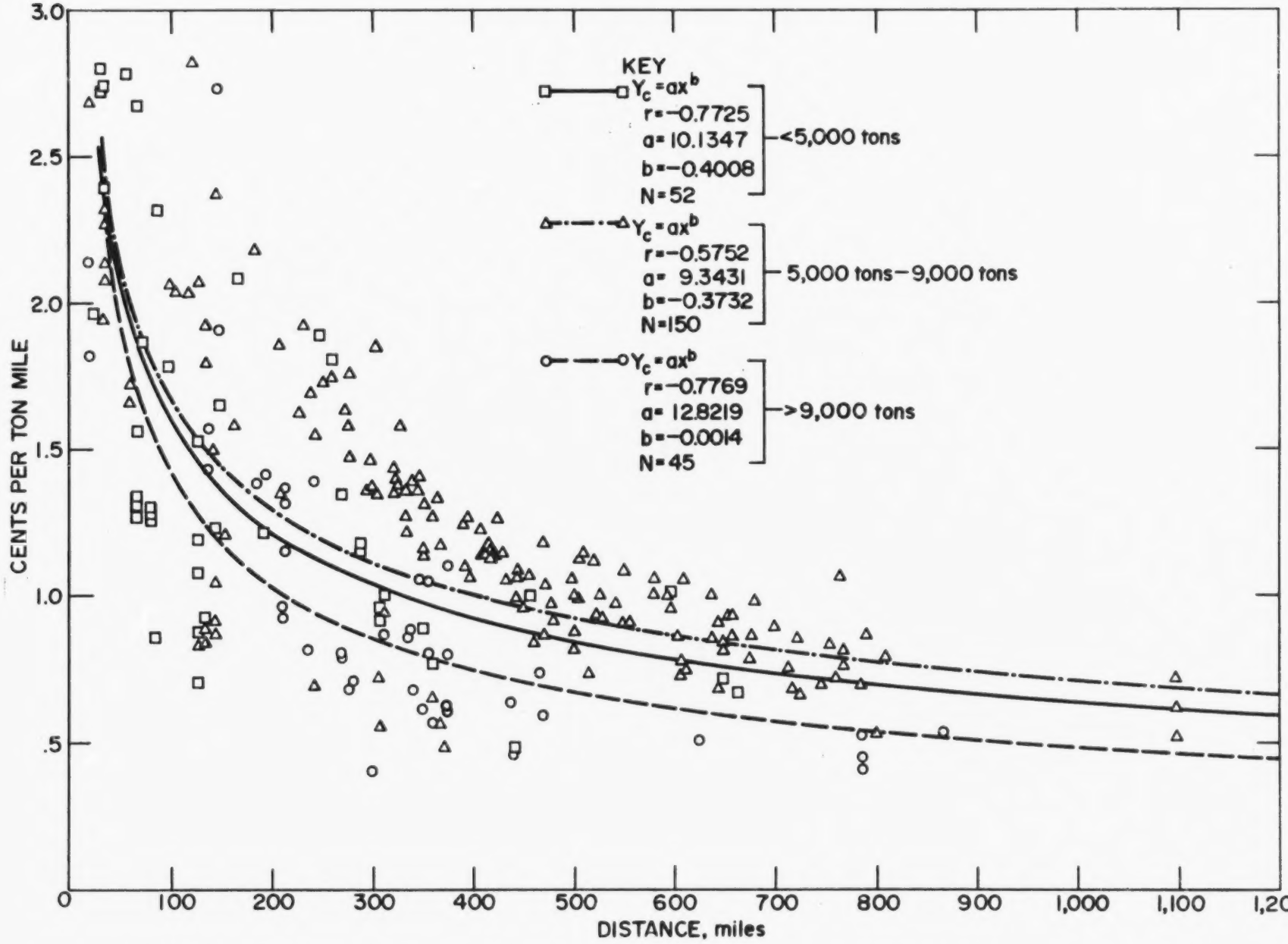

FIGURE 12. - Cost per ton mile for coal shipped by rail by minimum trainload tonnages.

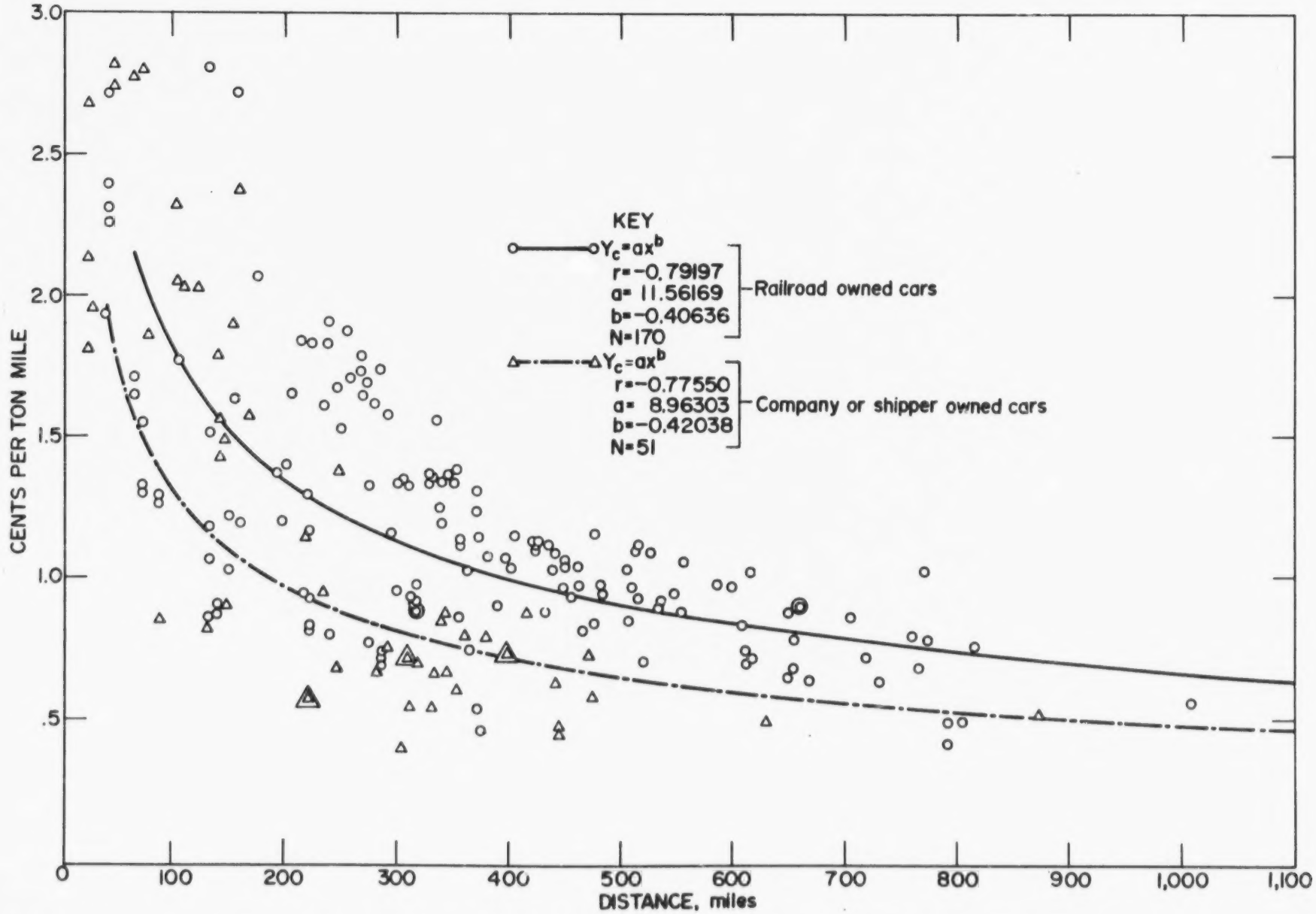

FIGURE 13. - Cost per ton mile for coal shipped by rail by car ownership.

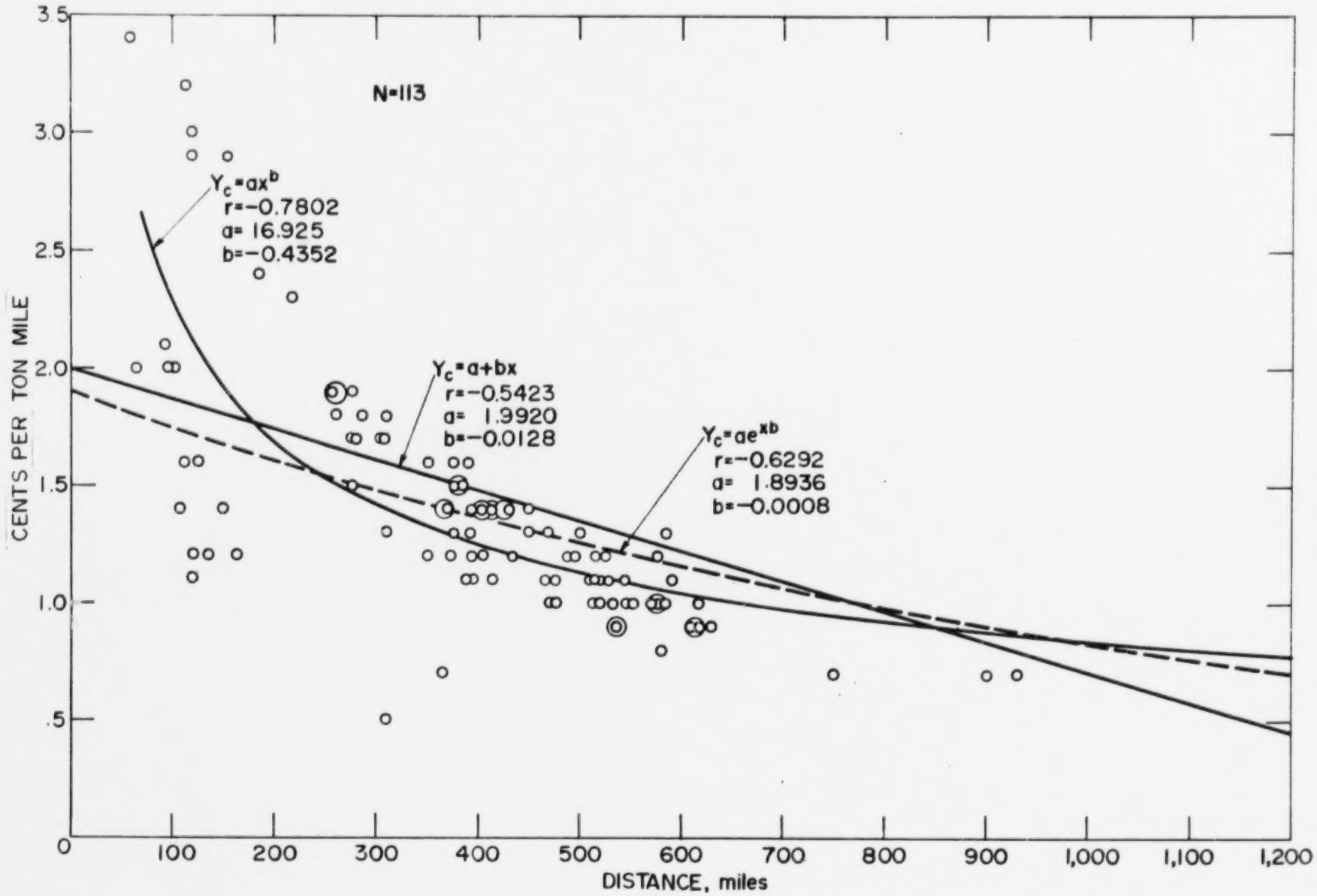

FIGURE 14. - Cost per ton mile for coal shipped by rail to oven-coke destinations.

Table 1 shows a relative comparison of the average calculated cost of shipping coal on a Btu basis for a common distance from different coal-producing districts. If the calculated value presented were the observed value for any distance, real costs of energy input could be determined for the coal districts presented. Although it is unlikely that calculated and observed values coincide, comparisons still can be made to determine the cheapest source of energy inputs from different geographic areas.

TABLE 1. - Summary of Btu values and railroad transport costs for coal in selected coal producing districts

Coal district	Average Btu's per ton of coal 1/ (in thousands)	Costs to transport coal selected distances by railroad 2/ (in cents per ton mile)			
		200	400	600	800
1	27,224	1.80	1.24	0.80	3/ 0.47
2	26,672	1.45	1.33	0.82	0.60
3	26,992	3/1.59	1.12	0.87	0.77
4	24,468	1.65	0.80	0.39	3/0.15
7	28,080	1.22	1.10	0.95	0.69
8	27,326	1.30	1.05	0.70	0.39
10	22,800	0.94	0.68	0.55	0.48
11	22,980	1.25	0.57	3/0.24	3/0.13

1/ Btu's on an as-received basis.
2/ Costs were extrapolated from best-fit regression equations for data available.
3/ Outside of the range of reported data.

Summary

Some major facts concerning transportation costs in the movement of coal from production area to point of consumption are revealed by this analysis. Significant economies of haul do exist for (1) longer versus shorter distances; (2) larger trainload sizes versus smaller trainload sizes; (3) company car ownership versus railroad car ownership. In addition to economies of haul, some comparisons can be made concerning the real costs of shipping energy from one coal producing area to all coal markets. Comparisons of the various figures with one another will serve this purpose.

A need for additional data is necessary to further delineate (1) the approximate costs of shipping coal from all coal producing districts in the U.S.; (2) the effect of annual coal tonnage contracts on costs; (3) the additional cost savings for unit trains and ownership of cars; and (4) the theoretical economies of haul for coal shipped from western coal producing areas to eastern coal markets.

TRANSPORTATION OF RESIDUAL FUEL OIL

Oil tanker and barge freight rates, cents per long ton mile, cents per million Btu, and nautical miles from the U.S. Gulf, Caribbean, Mexico, Mediterranean-North Africa, Europe, Persian Gulf, and Indonesia to New York-Long Island harbors and San Francisco, and from the San Francisco Bay area to inland ports on the San Joaquin and Sacramento Rivers are shown in tables 2-4. The rates shown in these tables pertain to the transportation of residual fuel oil and for crude oil hauled in dirty tankers. The lighter products are transported in clean tankers.

Foreign flag tankers carry almost all imported oil because operating costs for U.S. flag tankers are too high to be competitive. U.S. flag tanker activities is mainly confined to U.S. coastal movements of oil. Foreign flag tankers do not operate in this area (14).[1/] According to the Jones Act (9) merchandise may not be transported by foreign vessels, or American vessels not entitled to engage in coastwise trade, except by authorization, if and when in the interest of national defense.

Little oil moves from the U.S. Gulf to the West Coast and most of the fuel oil shipped up and down the West Coast is in oil company tankers (12).

1/ Underlined numbers in parentheses refer to items in the list of references at the end of this report.

TABLE 2. - Residual fuel oil tanker freight rates per long ton, from specified origins to New York City, 1970

Origin	Average miles	Voyage dollars per long ton	Cents per long ton mile	Cents per million Btu
U.S. Gulf				
Port Isabel or Brownsville, Tex.	1,952	$6.50	0.33	13.60
Corpus Christi, Tex.	1,864	6.50	0.33	13.60
Texas City, Freeport or Baytown, Tex.	1,888	6.30	0.33	13.20
Port Arthur, Tex.	1,837	6.15	0.33	12.85
Lake Charles or Beaumont, Tex.	1,842	6.15	0.33	12.85
New Orleans or Norco, La.	1,707	5.75	0.34	12.00
Ostrica or Pilot Town, La.	1,700	5.60	0.33	11.70
Baton Rouge, La.	1,840	6.10	0.33	12.75
Empire, La.	1,700	5.60	0.33	11.70
Mobile, Ala.	1,635	5.60	0.34	11.70
Baytown, Tex., and Baton Rouge, La.	1,888	7.25	0.38	15.15
Baytown and Freeport, Tex.	1,888	6.85	0.36	14.30
Baytown, Tex., and Lake Charles, La.	1,888	6.85	0.36	14.30
Corpus Christi and Port Arthur, Tex.	1,964	7.05	0.36	14.75
Mobile, Ala., and Ostrica, La.	1,635	6.20	0.38	13.00
Port Arthur, Tex., and Baton Rouge, La.	1,837	7.15	0.39	15.00
Caribbean				
Arroyo, Puerto Rico	1,425	5.39	0.38	11.30
Guayanilla, Puerto Rico	1,399	5.39	0.38	11.30
San Juan, Puerto Rico	1,275	5.29	0.41	11.10
Trinidad	1,932	6.40	0.33	13.40
St. Croix, Virgin Islands	1,300	5.48	0.42	11.50
Aruba, Netherlands West Indies	1,763	5.88	0.33	12.30
Curacao, Netherlands West Indies	1,770	5.88	0.33	12.30
Caripito, Venezuela	2,016	6.52	0.32	13.60
Puerto La Cruz, Venezuela	1,909	6.36	0.35	13.30
Puerto Las Minas, Venezuela	2,010	6.43	0.32	13.50
Punta Cardon, Venezuela	1,812	6.03	0.33	12.60
Cristobol, Panama	1,911	6.40	0.33	13.40
Kingston, Jamaica	1,270	5.26	0.41	11.00
St. Johns, Antigua	1,274	5.32	0.42	11.10
Covenas, Colombia	1,902	6.61	0.35	13.80
Mamonal, Colombia	1,846	6.43	0.35	13.50
Puerto Mexico, Mexico	1,907	6.40	0.34	13.40
Tampico, Mexico	1,999	6.73	0.34	14.10

TABLE 2. - Residual fuel oil tanker freight rates per long ton, from specified origins to New York City, 1970--continued

Origin	Average miles	Voyage dollars per long ton	Cents per long ton miles	Cents per million Btu
Mediterranean/Africa				
Algiers, Algeria	3,618	$7.80	0.22	16.32
Arzew, Algeria	3,463	7.70	0.22	16.10
Port Augusta, Silicy	5,224	8.91	0.17	18.60
Bonny, Nigeria	6,549	10.58	0.16	22.15
Cagliari, Sardinia	3,930	7.82	0.20	16.40
Raslanuf, Libya	5,240	9.60	0.18	20.10
Gela, Italy	4,100	8.75	0.21	18.30
Genoa, Italy	4,053	8.63	0.21	18.00
Huelva, Spain	3,135	7.08	0.23	14.80
Naples, Italy	4,185	8.82	0.21	18.50
Port Gentil, Gabon	5,100	10.74	0.21	22.50
Port Harcourt, Nigeria	5,111	10.70	0.21	22.40
Porto Torres, Italy	4,000	8.38	0.21	21.00
Sidon, Lebanon	5,202	10.23	0.20	21.40
Teneriffe, Canary Islands	2,926	6.64	0.23	13.90
Uskudar, Turkey	4,847	9.79	0.20	20.50
Europe				
Antwerp, Belgium	3,523	7.82	0.22	16.30
Bordeaux, France	3.241	8.19	0.25	17.10
Donges, France	3,500	7.61	0.22	15.90
Ghent, Belgium	3,136	7.75	0.25	16.20
Humber River, United Kingdom	3,075	7.75	0.25	16.20
Isle of Grain, United Kingdom	3,075	7.75	0.25	16.20
LaVera, France	3,502	8.51	0.24	17.80
Rotterdam, Netherlands	3,532	7.59	0.21	15.90
Southampton, United Kingdom	3,425	7.33	0.21	15.30
Persian Gulf				
Rasat Tannura, Saudi Arabia	10,728	21.51	0.20	45.00
Kuwait, Kuwait	12,000	24.26	0.20	50.80

TABLE 3. - Residual fuel oil tanker freight rates per long ton, from specified origins to San Francisco, 1970

Origin	Average Miles	Voyage dollars per long ton	Panama Canal dollars	Total dollars	Cents per long ton mile	Cents per million Btu
Caribbean						
Aruba, Netherlands West Indies	3,922	$ 9.58	$0.91	$10.49	0.24	20.00
Caripito, Venezuela	4,470	10.80	0.91	11.71	0.24	22.60
Puerto La Cruz, Venezuela	4,362	10.38	0.91	11.29	0.24	21.70
Puerto Las Minas, Venezuela	3,890	8.45	0.91	9.36	0.22	17.70
Punta Cardon, Venezuela	3,920	9.61	0.91	10.52	0.24	20.10
Covenas, Colombia	3,554	9.19	0.91	9.19	0.26	19.20
Mamonal, Colombia	3,562	9.16	0.91	9.16	0.26	19.15
Curacao, Netherlands West Indies	3,981	9.66	0.91	10.57	0.24	20.20
Guayanilla, Puerto Rico	4,282	10.38	0.91	11.29	0.24	21.70
Guayaquil, Ecuador	4,083	8.74	0.91	9.65	0.21	18.30
Tampico, Mexico	4,763	11.56	0.91	12.47	0.24	26.10
Trinidad Isle	4,430	10.72	0.91	11.63	0.24	24.30
Europe						
Rotterdam, Netherlands	8,091	19.05	0.91	19.96	0.24	41.80
Indonesia						
Palembang, Sumatra	8,833	16.77	---	16.77	0.19	35.10
Singapore, Malaya	8,500	16.19	---	16.19	0.19	33.90

TABLE 4. - Residual fuel oil barge freight rates per long ton, from San Francisco to inland destinations, 1970 for single voyages of the 1,300-3,200 long ton class

Origin	Destination	Miles	Voyage dollars	Cents per long ton mile	Cents per million Btu
San Francisco Bay Area	Emeryville	10	$0.76	7.6	0.16
	Alameda	12	0.76	6.3	0.13
	Oakland	15	0.76	5.1	0.11
	Richmond	20	0.76	3.8	0.08
	Oleum	34	0.76	2.2	0.05
	Mare Island	34	0.76	2.2	0.05
	Vallejo	34	0.76	2.2	0.05
	Petaluma	35	0.87	2.5	0.05
	Redwood City	35	1.03	2.9	0.06
	Port Costa	38	0.76	2.0	0.04
	Martinez	40	0.76	1.9	0.04
	Avon	42	0.76	1.8	0.04
	Pittsburg	53	0.87	1.6	0.03
	Antioch	59	0.87	1.5	0.03
	Rio Vista	65	1.33	2.0	0.04
	Stockton	86	1.18	1.4	0.03
	Sacramento	92	1.33	1.4	0.03

Oil imported to New York harbors in 1970 was estimated to be 31 million long tons (236 million barrels), an additional estimated 12 million barrels of oil was delivered from the U.S. Gulf. For the same period 5.5 million barrels were imported to the U.S. West Coast (2), of which 1.6 million barrels were barged to San Francisco Bay and inland ports (4).

Methodology

Oil tanker transportation rates are percentage variations negotiated from a flat rate applicable to the particular voyage for which the vessel is fixed. The percentage variation is referred to as a fixture (16). The rates used as a basis to construct the attached oil graphs were obtained by multiplying the fixture of each voyage made in 1970 by the average flat rate from the ports of each country and then summing the two.

Subsequently, the rates were grouped into three class sizes, namely, 16-25,000; 26-35,000; and 36-50,000 long-ton tankers. From these classes, the mean and standard deviation for the three class sizes sailing over the same route were estimated. By this method, comparisons of transportation costs between class sizes of tankers traveling the same number of miles were made.

The nautical miles used in the oil diagrams for distances from port to port and the tanker class size groups are representative of the average voyage distances and vessel sizes predominately in use by the shipping trade.

The data for the barge table and curve were obtained from a rate schedule published by the San Francisco Barge Traffic Bureau, San Francisco, Calif. (11).

The data and analyses are for tankers and barges-for-hire only and no estimation of costs of shipping are made for leased or oil company owned ships because data is not available. The trade refers to rates made for tankers-for-hire as the spot market.

The tanker freight rates listed in the tables are the sum of the average fixtures and the flat rate quoted for the respective tanker voyages. The distances for each voyage in nautical miles were obtained from the British-Petroleum Tanker Co., Ltd., London, England (1).

Analysis

The analyses of the data for oil differs from the analyses for coal. Regression analyses could not be used to show comparative transportation costs relative to distance because data for distance of haul were not available for tanker voyages other than the mean distance for the voyages by tankers-for-hire.

The dispersion of rate charges between classes and within classes for the same route are mainly caused by the supply and demand of available tankers at a particular location at a point in time. Periods of greatest demand occur during the fall and winter months.

About 30 percent of the total world tanker fleet operates in the spot market at any one time. The supply of tankers in the spot market is inelastic. In times of great demand, additional tonnage cannot be

obtained in the short term and when freight tanker demand is low, the scrapping of obsolete and worn tankers is increased (16).

Forecasting the supply, demand, and price relationship of oil tanker transportation in the spot market would be almost impossible. However, the data and the analyses have value. Freight costs for specific voyages by tankers of the same class size sailing at different periods of time during 1970 differ because rates are negotiated on a single voyage basis at a point in time, and they are dependent on the supply of and demand for tankers. Figures 15-18 show that rates on the average for the tankers in the 16,000 to 25,000 ton class are always higher than the rates of the larger ton classes. Analysis of barge rates to San Francisco inland ports shown in figure 19 indicates the economies associated with distance for barges in the 1,300 to 3,200 long ton class.

Foreign tanker freight rates to the New York SMSA for an average distance of 1,800 miles from ports in the Caribbean are on the average 0.36 cents per long ton mile (table 2). The long ton mile average cost for an average distance of about 4,000 miles from the Mediterranean, North Africa, and Europe is 0.21 cents. The average cost per long ton mile from the Persian Gulf via the Cape of Good Hope, a distance of about 12,000 miles, is 0.20 cents. Therefore, economies of haul probably exist.

From the Caribbean the cost of transporting oil per million Btu average 12.50 cents while the same cost from the Mediterranean, North Africa, and Europe is 17.50 cents. The average Btu cost for the

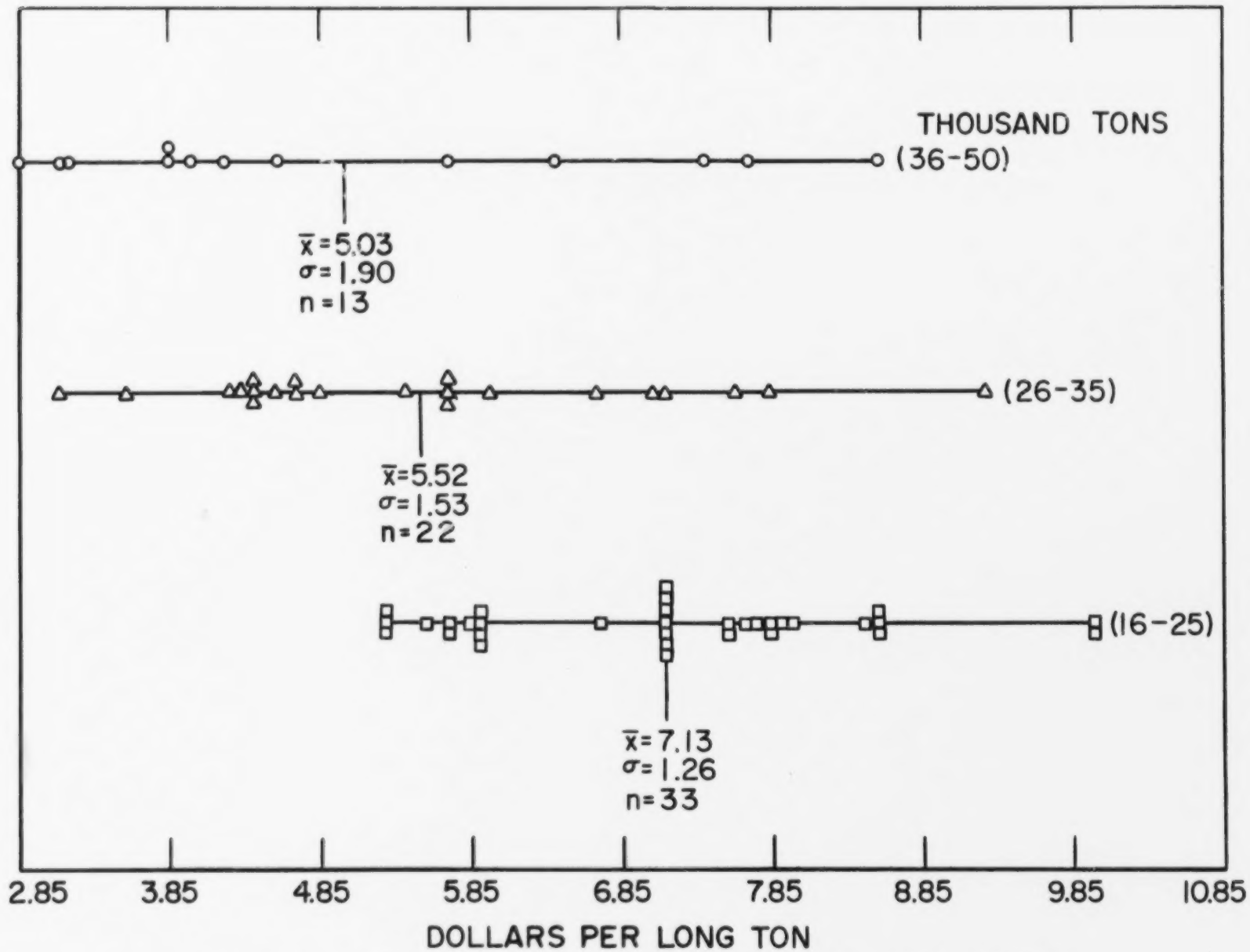

FIGURE 15. - Negotiated tanker rates from U.S. Gulf to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 1,800 miles.

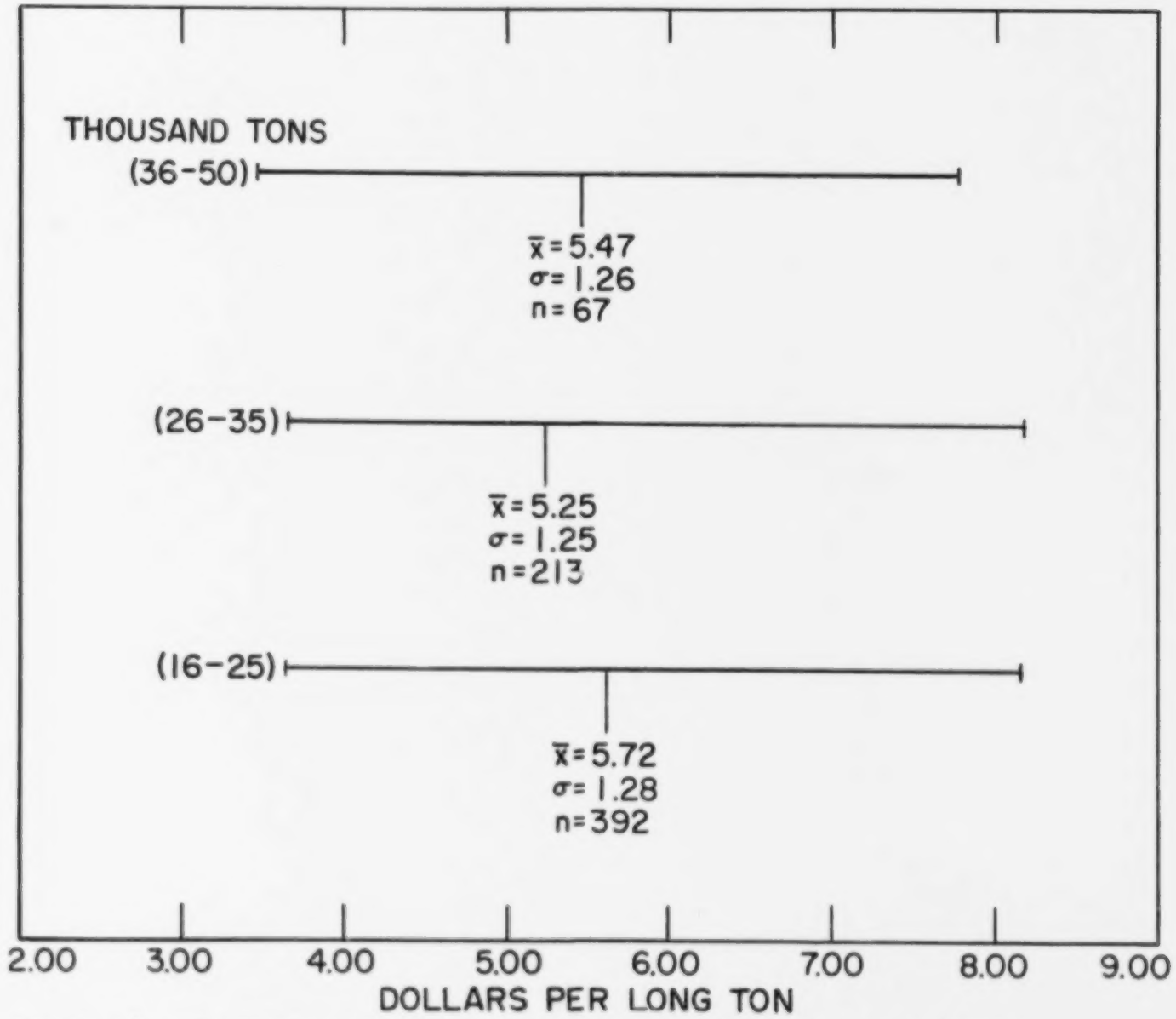

FIGURE 16. - Negotiated tanker rates from the Caribbeans to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 1,800 miles.

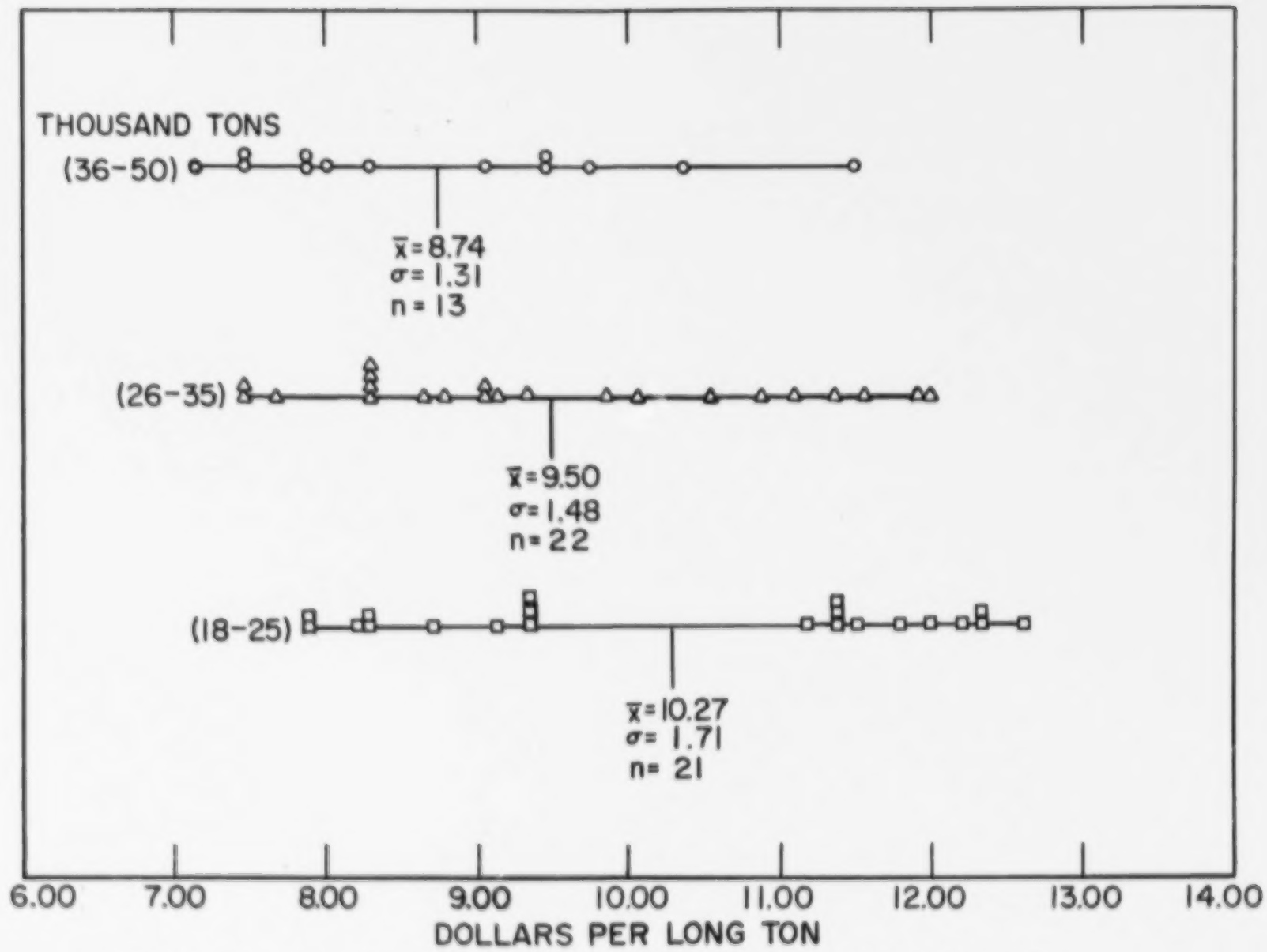

FIGURE 17. - Negotiated tanker rates from the Mediterranean to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 5,200 miles.

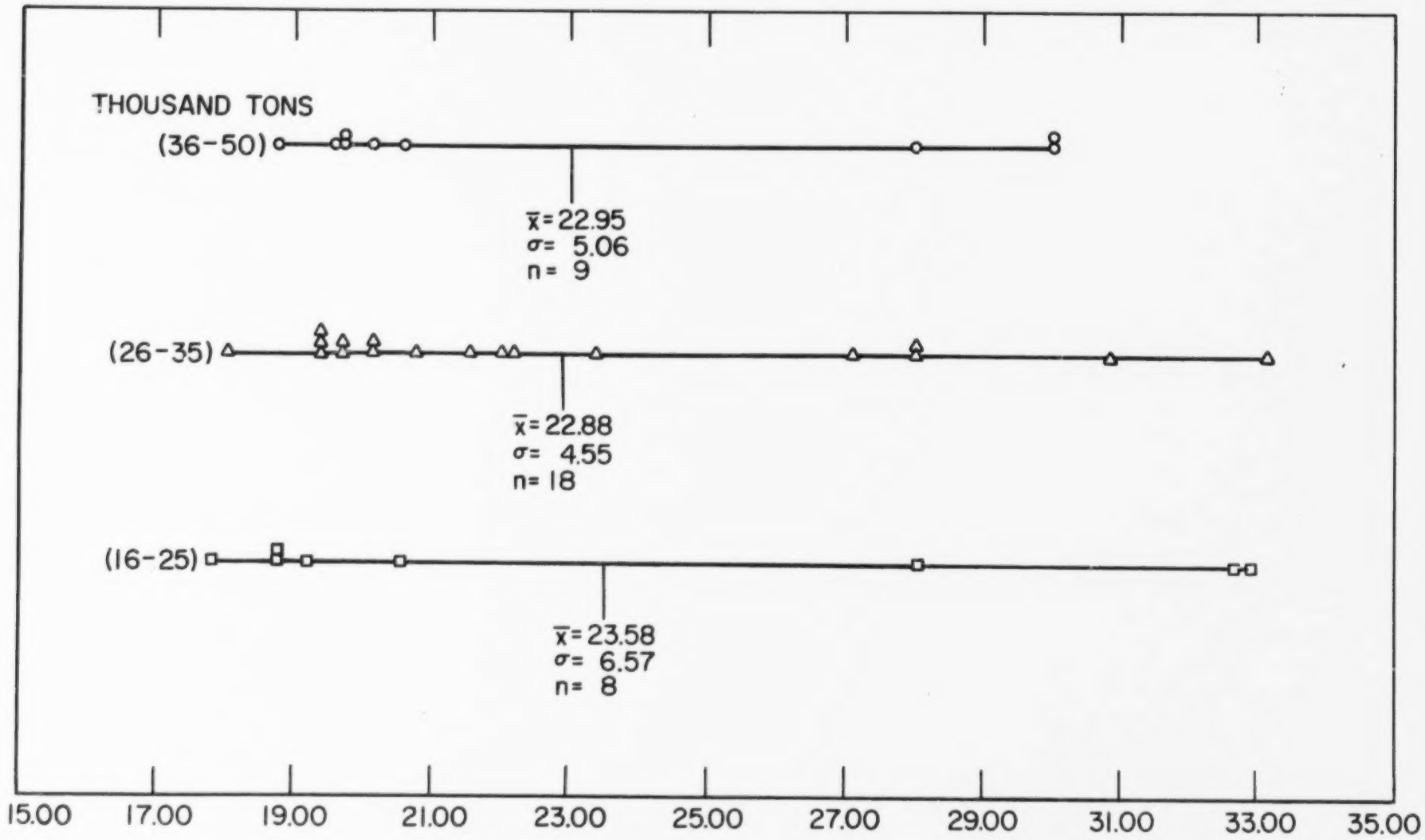

FIGURE 18. - Negotiated tanker rates from Persian Gulf to U.S. Atlantic Coast, 1970, by size of tankers carrying residual fuel oil for single voyages, average 12,000 miles via Cape of Good Hope.

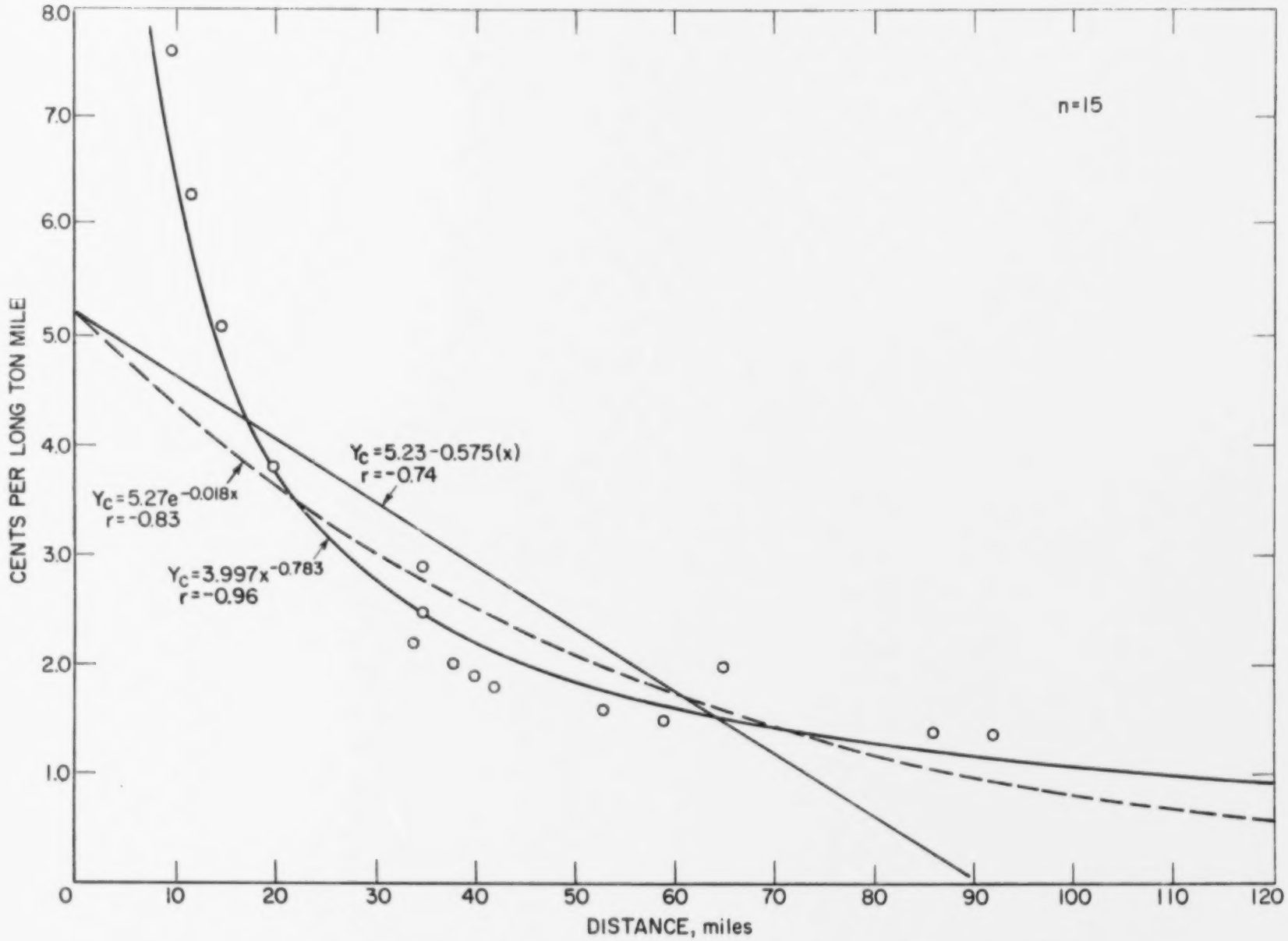

FIGURE 19. - Residual fuel oil barge freight rates per long ton from San Francisco to inland destinations, 1970, for single voyages of the 1,300-3,200 long ton class size.

Persian Gulf voyage was about 48.0 cents per million. Therefore, the higher Btu costs from areas outside the Caribbean area partly explains why only 30 percent (9.3 million long tons) is imported to the New York SMSA and 70 percent (21.7 million long tons) comes from the Caribbean.

In 1970 approximately 1.65 million long tons (12 million barrels) were transported from the U.S. Gulf to the New York SMSA.

Table 3, showing data for oil transported to San Francisco SMSA in 1970, reveals that no oil was transported from the U.S. Gulf and imported from the Persian Gulf and only 5.6 million barrels were delivered from the Caribbean, Europe, and Indonesia.

A comparison of costs per million Btu indicates why practically all of the residual received at San Francisco harbor was imported from the Caribbean. The average cost per million Btu from this area was 21.0 cents compared to about 42.0 cents from Europe and 34.0 cents from Indonesia. Oil does not move from the U.S. Gulf to the West Coast because can be brought in from the Caribbean for less money. It costs twice as much to deliver oil from the U.S. Gulf to the West Coast as it does to ship it from the Gulf to ports in the North Atlantic (16).

Summary

Analysis of the data reveals that tanker rates for transporting residual oil are on the average less when transporting by larger versus smaller tankers. The most economical supply of oil for use in the San Francisco and New York SMSA's is shipped from the Caribbean.

One of the greatest problems encountered in this section was the inability to gather data on flat rates and negotiated fixture rates that could be directly correlated to distance and size of tanker. Because of this, mean distances and grouped tanker sizes were used in place of regression analyses.

For a more thorough analysis of the cost parameters in shipping oil, data should be collected for similar time periods to isolate those costs associated with the supply and demand of tankers at a point in time. Regression analyses could then be used in a more meaningful manner to show any economies of haul which may be associated with distance or size of tanker.

TRANSMISSION OF NATURAL GAS

A description of natural gas pipeline systems and transmission costs for delivery of gas to the New York and San Francisco SMSA's is presented in this section. Natural gas pipeline systems to the two study areas are shown in figure 20 for 1970.

The selling price of gas transported by interstate pipeline if regulated by the Federal Power Commission (FPC) to the extent that it allows a reasonable rate of return to the transmission gas company.

According to the gas industry, the higher rates are caused by costs incurred to build new pipelines or modernize old ones which must necessarily be paid for through sales revenues.

Table 5 shows the systems, points of origin, effective date of rate, annual volume of gas to SMSA, pipeline distance, and cost of transmission.

Gas transmission companies and pipeline routes were obtained from the FPC (7). Transmission rates, pipeline mileage, and volume of gas delivered were obtained from transmission companies, gas utilities, and FPC reports (6).

Tennessee Gas Pipeline Co., Transcontinental Gas Pipe Line Corp., El Paso National Gas Co., and Pacific Gas and Electric Utility Co. contributed all necessary data and information. Rates and gas volumes for Texas Eastern Transmission Co. and Manufacturers Light and Heat Co. were obtained by subtracting their total gas purchases from sales to the New York SMSA in 1969. The pipeline mileage for each of these two systems was measured from an FPC pipeline systems map.

TABLE 5. - Natural gas pipeline transmission rates to New York and San Francisco SMSA's

Transmission company	Origin	Date effective	Annual volume million c.f.	Line miles	Cents per Mcf and million B.T.U./mile
Transcontinental Gas Pipeline Corp. to New York SMSA	Willacy, Texas	1970	238,000	1,800	0.011
Texas Eastern Transmission Co. to New York SMSA and Algonquin Gas Transmission Co. to Newark SMSA	Hidalgo Co., Texas Warren Co., N.J.	1969 1969	54,000 128,000	1,885	0.013
Tennessee Gas Pipeline Co. to New York SMSA	Willacy Co., Texas Vermillion Co., La. New Orleans, La.	1971	20,075	1,900	0.020
Manufacturers Light & Heat Co. and Home Gas Co. to New York SMSA	Monongalia Co., W. Va. Wood Co., W. Va.	1971	8,000	450	0.031
El Paso Natural Gas Co. - Texas to Ariz. - Cal. border	Yoakum Co., Texas San Juan Co., Utah San Juan Co., N.M.	1972	412,000	1,000	0.019
Pacific Gas and Electric Co. Ariz. - Cal. border to San Francisco SMSA	Topok, Mohave Co., Ariz.	1972	412,000	550	0.008
Pacific Gas Transmission Co. Canada to Oregon - Cal. border	Kingsgate, B.C., Canada	1972	431,000	600	0.015
Pacific Gas and Electric Co. Oregon Cal. border to San Francisco SMSA	Malin, Klamath Co., Oregon	1972	427,000	350	0.010

FIGURE 20. - Natural gas pipeline systems to the New York and San Francisco SMSA's, 1970

Analysis of Data

Based on information and estimated purchases and costs for 1972 (10), Pacific Gas and Electric Co. will purchase some 839 billion cubic feet of gas for resale. Of this, about 427 billion cubic feet (51 percent) will come from Canada and 412 billion cubic feet (49 percent) will be supplied by El Paso Natural Gas Co., Texas.

The Canadian gas will be received at Kingsgate, B. C., by Pacific Gas Transmission Company and transmitted 600 miles to Malin, Oregon, at the California border at a total trip cost of 9.00 cents per Mcf or 0.015 cents per mile which is also the cost per million Btu.

From Malin, Oregon, Pacific Gas and Electric Co. will transmit the gas to the San Francisco SMSA at 0.010 cent per Mcf per mile or million Btu for the 350 mile run.

Gas from the Permian and San Juan Basins will provide about 412 million cubic feet at a pipeline transmission cost of 19.0 cents per thousand cubic feet or 0.019 cents per mile for the 1,000 mile trip to the Arizona border (5). From the California-Arizona border the gas will be transmitted at a cost of 0.008 cents per thousand cubic feet per mile or a million Btu for the 550 mile run.

Four major gas pipeline systems supply New York SMSA. Transcontinental Gas Pipeline starts at Brownsville, Texas. About 238 billion cubic feet of gas per year moves to New York SMSA at a cost of 0.011 cents per million Btu per mile. This cost is applicable only when the 100 percent load-supply factor of 600 million cubic feet delivered to Philadelphia SMSA, New Jersey SMSA, and New York SMSA is considered (15).

Of the 987 billion cubic feet of gas that flowed through Texas Eastern's lines to consumers in Ohio, Pennsylvania, New Jersey, and New York in 1969, only 54 billion were delivered to New York SMSA (6). Algonquin Gas Transmission Co. pipeline, partially owned by Texas Eastern, takes off from Texas Eastern's line at the Pennsylvania-New Jersey border below Phillipsburg, New Jersey. It supplied some 128 billion cubic feet of gas to the Newark area, a part of New York SMSA (6) in 1969. The line is about 125 miles in length (7). The average transmission rate for this 1,885 mile pipeline system is 0.013 cents per billion Btu per mile (6).

Tennessee Gas Pipeline Co. currently transmits about 20 billion cubic feet of gas to the New York SMSA (13). Gas through this system traveled 1,900 miles, and according to Tennessee Gas, the transmission cost for their system to the New York SMSA is about 0.020 cents per thousand cubic feet per mile.

Manufacturers Light and Heat Co. sold about 8 billion cubic feet of gas in the New York SMSA in 1969 through its affiliate Home Gas Co. (6). The pipeline system is about 450 miles long. Gas purchases in West Virginia, Pennsylvania, and Ohio were added to complement the supply. The transportation rates which include profit are calculated by subtracting the weighted average purchase price of gas (34.05 cents per Mcf) from the weighted average delivered selling price (48.28 cents per Mcf) (6). This yields a rate of 0.031 cents per million Btu per mile.

Gas selling price in the New York SMSA by transmission companies to electric utilities and gas distributing companies was 42.22 cents. per million Btu in 1970 (8). The average cost for transmitting gas on a national basis is about 1.0 cent per million Btu per 100 miles.

Summary

The natural gas industry including its interstate transmission systems, operating practices, and rate adjustments which include a normal profit is regulated by the FPC.

Gas transmission companies indicate that for a rule-of-thumb estimate, 1,000 cubic feet of gas can be moved 100 miles for 1.0 cent. The average rate for the pipeline systems in this report was 1.5 cents/ thousand cubic feet per 100 miles.

The average cost of transmitting gas from the Texas fields to the New York SMSA is 28.0 cents per thousand cubic feet. The cost of moving gas from the Texas fields to the San Francisco SMSA is 16 cents per thousand cubic feet.

For future study, it may be possible that costs of transmission only could be obtained for most companies serving several major metropolitan areas from rate adjustment applications filed with FPC in 1970 and 1971.

RECOMMENDATIONS

This report perused the parameters of the complex fossil fuel transportation universe. Although a significant amount of data have been collected, certain areas are still incomplete. It is therefore recommended that a more thorough analysis be made of the individual parameters within the transportation system by (1) gathering all the data possible to complete the transportation universe; (2) making greater stratifications of the data collected to gain more precise information of the parameters in the system which affect cost; (3) obtaining theoretical cost structures for fossil fuels to markets where they are currently not marketed, i.e., the cost of shipping western coal to eastern markets and the cost of marketing residual fuel oil further into the interior of the continental U.S. It is also recommended that an analysis be made to compare and offer an explanation for the consumption of coal, oil, and gas in major SMSA's.

REFERENCES

1. British-Petroleum Tanker Company Limited. World-Wide Marine Distance Tables, 1958, 144 pp.
2. Bureau of Mines, Mineral Industry Surveys. Crude Petroleum, Petroleum Products, and Natural Gas Liquids. December, 1970, 37 pp.
3. Delaware River Port Authority. Waterborne Commerce Report, 1970, p. 76, 94.
4. Department of the Army Corps of Engineers, Waterborne Commerce of the United States. National Summaries, 1969, p. 85.
5. El Paso Natural Gas Company, El Paso, Texas. Personal Communication. May 12, 1970.
6. Federal Power Commission. Annual Report. Form 2, December 31, 1969, pp. 519-520, 535-536.
7. Federal Power Commission. Major Pipelines Map. June 30, 1970.
8. Federal Power Commission. News Release No. 16987. September 14, 1970.
9. Jones Act, Section 883, Title 46, United States Code.
10. Pacific Gas and Electric Company, San Francisco, California. Personal communication. May 12, 1971.
11. San Francisco Barge Tariff Bureau. Local Freight Tariff No. 1. 1968, p. 10.
12. Standard Oil Company, San Francisco, California. Personal communication. May 3, 1971.

13. Tennessee Gas Pipeline Company, Houston, Texas. Personal communication. May 18, 1971.

14. The Association of Ship Brokers and Agents, Incorporated. Worldwide Tanker Nominal Freight Scale and American Tanker Rate Schedule. 1970, pp. 98-99, 124.

15. Transcontinental Gas Pipeline Corporation, Houston, Texas. Personal communication. May 11, 1971.

16. United Nations Conference of Trade and Development. Level and Structure of Freight Rates, Conference Practices and Adequacy of Shipping Services. 1969, pp. 23-28.

COAL APPENDIX

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969

Oven-coke plant	Location of plant	Coal purchases: Name of company	Coal purchases: Name of mine	Mine location: Shipping point	Mine location: County	Mine location: State	Mine location: Coal producing district	Mine location: Freight rate district	Transportation charges: Method of movement	Transportation charges: Rate per ton	Transportation charges: Application	Transportation charges: Mileage	Transportation charges: Rate per ton-mile (cents)
Alabama													
Empire Coke Co.	Holt	Bankhead Mining Co.	Cobb	Jasper	Walker	Alabama	11	Alabama	All-rail	$ 3.38	Single-car	36	9.5
		Consolidation Coal Co.	Crane Creek	McComas	Mercer	West Virginia	7	Pocahontas	All-rail	5.79	5,000 ton-trainload	529	1.1
		Hawks Nest Mining Co.	Hawks Nest	Page	Fayette	West Virginia	8	Kanawha	All-rail	5.91	5,000 ton-trainload	629	.9
Republic Steel Corp.	Gadsden	Republic Steel Corp.	Sayre	Sayre	Jefferson	Alabama	11	Alabama	All-rail	1.98	Single-car	93	2.1
		Black Diamond Coal Mining Co.	No. 4	Black Diamond	Jefferson	Alabama	11	Alabama	All-rail	2.00	Single-car	101	2.0
		Bankhead Mng. Co., Inc.	Cobb	Jasper	Walker	Alabama	11	Alabama	All-rail	2.51	Single-car	365	0.7
		Clinchfield Coal-Div. of the Pittston Co.	Moss No. 2	Dante	Russell	Virginia	8	Tiller	All-rail	5.91	5,000 ton-trainload	373	1.6
Republic Steel Corp.	Thomas	Republic Steel Corp.	Sayre	Sayre	Jefferson	Alabama	11	Alabama	All-rail	NA	Single-car	26	NA
		Clinchfield Coal-Div. of the Pittston Co.	Moss No. 2	Clinchfield	Russell	Virginia	8	Tiller	All-rail	5.91	5,000 ton-trainload	412	1.4
U.S. Pipe and Foundry Co.	Birmingham	U.S. Pipe & Fdry. Co.	Bessie	Bessie Mine	Jefferson	Alabama	11	Alabama	All-rail	NA	Operates own railroad		NA
		U.S. Pipe & Fdry. Co.	Flat Top	Flat Top	Jefferson	Alabama	11	Alabama	All-rail	NA	Operates own railroad		NA
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	Virginian	All-rail	5.77	5,000 ton-trainload	412	1.4
		Winding Gulf Coal, Inc.	MacAlpin	MacAlpin	Raleigh	West Virginia	7	New River	All-rail	5.77	5,000 ton-trainload	412	1.4
		Itmann Coal Co.	Itmann	Itmann	Wyoming	West Virginia	7	Virginian	All-rail	5.77	5,000 ton-trainload	415	1.4
Alabama By-Products	Tarrant	Alabama By-Products	Marine	Marine	Jefferson	Alabama	11	Alabama	All-rail	NA	Single-car	26	NA
		Winding Gulf Coals, Inc.	Clifftop 1, 2, & 3	Clifftop	Fayette	West Virginia	7	New River	All-rail	5.77	5,000 ton-trainload	467	1.2
		Minden Sewell Coal Co.	No. 2	Rock Lick	Fayette	West Virginia	7	New River	All-rail	5.77	5,000 ton-trainload	510	1.1
		Beards Fork Coal Mng. Corp.	Beards Fork	Beards Fork	Fayette	West Virginia	7	Virginian	All-rail	5.77	5,000 ton-trainload	515	1.1
U.S. Steel Corp.	Fairfield	U.S. Steel Corp.	Concord	Concord	Jefferson	Alabama	11	Alabama	Operates own R.R.	NA			NA
		Westmoreland Coal Co.	Pine Branch	Pine Branch	Wise	Virginia	8	Clinch Valley	All-rail	4.89	5,000 ton-trainload	375	1.3
		Westmoreland Coal Co.	Osaka	Stonega	Wise	Virginia	8	Clinch Valley	All-rail	4.89	5,000 ton-trainload	375	1.3
		Westmoreland Coal Co.	Prescott	Osaka	Wise	Virginia	8	Clinch Valley	All-rail	4.89	5,000 ton-trainload	375	1.3
		Burgess, A. E. Co.	West Blockton	West Blockton	Bibb	Alabama	11	Alabama	All-rail	2.07	5,000 ton-trainload	62	3.3
Woodward Iron Co.	Woodward	Woodward Iron Co.	Mulga	Woodward	Jefferson	Alabama	11	Alabama	Operates own R.R.	NA		NA	NA
		Coal Processing Corp.	Diziana	Diziana	Wise	Virginia	8	Clinch Valley	All-rail	4.89	5,000 ton-trainload		
		Consolidation Coal Co.	Jenkinjones	Pageton	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	5,000 ton-trainload	450	1.3
California													
Kaiser Steel Corp.	Fontana	Kaiser Steel Corp.	No. 1	Sunnyside	Carbon	Utah	20	Castle Gate	All-rail	4.89	Not less than 200,000 tons annually	753	0.7
		Kaiser Steel Corp.	York Canyon	York Canyon	Colfax	New Mexico	18	Raton	All-rail	6.15	----do----	893	0.7
		Mid-Continent Coal and Coke Co.	Dutch Creek		Pitkin	Colorado	16	Carbondale	All-rail	5.89		840	0.7
		Consolidation Coal Co.	Jenkinjones	Pageton	McDowell	West Virginia	7	Pocahontas	All-rail	10.33	5,000 ton-trainload	2,430	0.7
Colorado													
Colorado Fuel & Iron Steel Co.	Pueblo	Colorado Fuel & Iron Steel Co.	Allen	Weston	Las Animas	Colorado	17	Oak Hills	Operates own R.R.	NA		NA	NA
		Silengo Coal Co.	Wise Hill No. 3	Craig	Moffat	Colorado	17	Oak Hills	All-rail	4.25	Single-car	275	1.5
		Winding Gulf Coal, Inc.	Clifftop No. 1, 2, 3	Clifftop	Fayette	West Virginia	7	New River	All-rail	12.16	7,200 ton-trainload	1,450	0.8
		Winding Gulf Coal, Inc.	East Gulf	East Gulf	Raleigh	West Virginia	7	New River	All-rail	12.16	7,200 ton-trainload	1,400	0.9
Illinois													
General Motors Corp.	Waukegan	Harman Mng. Corp.	Harman	Harman	Buchanan	Virginia	8	Thacker	All-rail	7.12	Single-car	575	1.2
		Eastern Associated Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	All-rail	7.37	Single-car	585	1.3
Granite City Steel Co.	Granite City	Freeman Coal Mng. Corp.	Orient No. 3	Orient	Jefferson	Illinois	10	Group 6	All-rail	1.49	2,500 ton-trainload	120	1.2
		Freeman Coal Mng. Corp.	Orient No. 5	West Frankfort	Franklin	Illinois	10	Group 6	All-rail	1.63	2,500 ton-trainload	135	1.2
		Sahara Coal Co., Inc.	Sahara No. 6	Harrisburg	Saline	Illinois	10	Group 6	All-rail	---	2,500 ton-trainload	140	NA
		Old Ben Coal Corp.	No. 21	Sesser	Franklin	Illinois	10	Group 6	All-rail	1.49	2,500 ton-trainload	107	1.4
		Eastern Associated Coal Corp.	Wharton No. 4	Wharton	Boone	West Virginia	8	Kanawha	All-rail	5.91	Single-car	545	1.1
		Winding Gulf Coals, Inc.	West Gulf No. 5	Beckley	Raleigh	West Virginia	7	Virginian	All-rail	5.75	5,000 ton-trainload	575	1.0

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969—Continued

Oven-coke plant	Location of plant	Coal purchases: Name of company	Coal purchases: Name of mine	Mine location: Shipping point	County	State	Coal producing district	Freight rate district	Transportation charges: Method of movement	Rate per ton	Application	Mileage	Rate per ton-mile (cents)
Illinois (continued)													
Interlake Steel Corp.	Chicago	Island Creek Coal Co.	No. 28	Holden	Logan	West Virginia	8	Logan	All-rail	5.52	7,200 ton-trainload	512	1.0
		Consolidation Coal Co.	Newhall	Newhall	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	545	1.0
		Consolidation Coal Co.	Eckman	Holden	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	545	1.0
		Winding Gulf Coals, Inc.	West Gulf No. 6	Eccles	Raleigh	West Virginia	7	Virginian	All-rail	5.77	7,200 ton-trainload	545	1.0
		Freeman Coal Mng. Corp.	Orient No. 5	West Frankfort	Franklin	Illinois	10	Group 6	All-rail	2.99	2,500 ton-trainload	309	.96
International Harvester Co.	Chicago	International Harvester Co.	Wisconsin Steel Co.	Benhass	Harlan	Kentucky	8	Harlan	All-rail	5.52	7,200 ton-trainload	549	1.0
		United Pocahontas Coals, Inc.	Indian Ridge No. 6	North Fork	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	577	1.0
		Royalty Smokeless Coal Co.	Premier	Premier	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	545	1.0
		Old Ben Coal Corp.	No. 21	Sesser	Franklin	Illinois	10	Group 6	All-rail		2,500 ton-trainload	309	1.8
		Amigo Smokeless Coal Co.	Amigo	Amigo	Raleigh	West Virginia	7	Virginian	All-rail	5.77	7,200 ton-trainload	552	1.0
		Itmann Coal Co.	Itmann	Itmann	Wyoming	West Virginia	7	Virginian	All-rail	5.77	7,200 ton-trainload	552	1.0
Republic Steel Corp.	Chicago	Republic Steel Corp.	Republic	Marrowbone	Pike	Kentucky	8	Thanker	All-rail	5.52	7,200 ton-trainload	532	1.0
		Winding Gulf Coals, Inc.	East Gulf	East Gulf	Raleigh	West Virginia	7	Virginian	All-rail	5.77	7,200 ton-trainload	549	1.0
Indiana (6)													
Citizens Gas & Coke Utility	Indianapolis	Norton Coal Co.	Norton	Norton	Wise	Virginia	8	Clinch Valley No. 2	All-rail	4.83	5,000 ton-trainload	580	.8
		Margaret Ann Coal Co.	Margaret Ann	Conaway	Buchanan	Virginia	8	Thacker	All-rail	4.83	5,000 ton-trainload	535	.9
		Jewell Ridge Coal Corp.	Jewell Valley	Jewell Valley	Buchanan	Virginia	7	Upper Buchanan	All-rail	4.95	5,000 ton-trainload	535	.9
		Winding Gulf Coals, Inc.	No. 4	Winding Gulf	Raleigh	West Virginia	7	New River	All-rail	4.95	5,000 ton-trainload	404	1.2
		Island Creek Coal Co.	Coal Mountain	Coal Mountain	Wyoming	West Virginia	8	Virginian	All-rail	4.83	5,000 ton-trainload	396	1.2
Indiana Gas & Chemical Corp.	Terre Haute	Winding Gulf Coals, Inc.	MacAlpin	MacAlpin	Raleigh	West Virginia	7	New River	All-rail	5.24	5,000 ton-trainload	476	1.1
		Amherst Coal Co.	Lundale No. 1	Amherstdale	Logan	West Virginia	8	Logan	All-rail	5.12	5,000 ton-trainload	433	1.2
		Consolidation Coal Co.	Jenkinjones	Pageton	McDowell	West Virginia	7	Pocahontas	All-rail	5.24	5,000 ton-trainload	466	1.1
		Itmann Coal Co.	Itmann	Itmann	Wyoming	West Virginia	7	Virginian	All-rail	5.12	5,000 ton-trainload	476	1.0
		Ratliff Elkhorn Mng. Co.	Raccoon	Pikeville	Pike	Kentucky	8	Thacker	All-rail	5.12	5,000 ton-trainload	458	1.1
Inland Steel Co.	East Chicago	Bishop Coal Co.	Bishop	Bishop	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	545	1.1
		Inland Steel Co.	Inland	Sesser	Jefferson	Illinois	10	Group 6	All-rail	3.67	2,500 ton-trainload	309	1.2
		Freeman Coal Mng. Corp.	Orient No. 3	Orient	Jefferson	Illinois	10	Group 6	All-rail	3.67	2,500 ton-trainload	309	1.2
		Freeman Coal Mng. Corp.	Orient No. 5	West Frankfort	Franklin	Illinois	10	Group 6	All-rail	1.63	2,500 ton-trainload	309	.5
		Kentland-Elkhorn Coal Corp.	Spruce Fork	Biggs	Pike	Kentucky	8	Thacker	All-rail	5.52	7,200 ton-trainload	535	1.0
		Kentland-Elkhorn Coal Corp.	Peter Creek	Phelps	Pike	Kentucky	8	Thacker	All-rail	5.52	7,200 ton-trainload	535	1.0
		Island Creek Coal Co.	Gund	N & W RR	Pike	Kentucky	8	Thacker	All-rail	5.52	7,200 ton-trainload	535	1.0
		Jewell Ridge Coal Corp.	Jewell Valley	Jewell Valley	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.77	7,200 ton-trainload	535	1.1
U.S. Steel Corp.	Gary	U.S. Steel Corp.	Nos. 2,6,9,10,14	Munson	McDowell	West Virginia	7	Pocahontas	All-rail	5.77	7,200 ton-trainload	542	1.1
		U.S. Steel Corp.	Nos. 7 & 32	Lynch	Harlan	Kentucky	8	Harlan	All-rail	5.52	7,200 ton-trainload	530	1.1
		Island Creek Coal Co.	No. 27	Holden	Logan	West Virginia	8	Logan	All-rail	5.52	7,200 ton-trainload	542	1.0
		Freeman Coal Mng. Corp.	Orient No. 3	Orient	Jefferson	Illinois	10	Group 6	All-rail			309	NA
Youngstown Sheet & Tube Co.	East Chicago	Youngstown Mines Corp.	Dehue	Dehue	Logan	West Virginia	8	Logan	All-rail	5.52	7,200 ton-trainload	512	1.1
		Olga Coal Co.	Olga	Susanna	McDowell	West Virginia	7	Tug River	All-rail	5.77	7,200 ton-trainload	545	1.1
		Cumberland Collieries Inc.	Clintwood No. 1	Mullins	Dickinson	Virginia	8	Tiller	All-rail	5.52	7,200 ton-trainload	553	.99
		Cumberland Collieries Inc.	Bird No. 2	Norton	Dickinson	Virginia	8	Tiller	All-rail	5.52	7,200 ton-trainload	580	.95
		Gauley Coal & Coke Co.	Tioga No. 1	Tioga	Nicholas	West Virginia	3	Gauley	All-rail	5.77	7,200 ton-trainload	612	.94
Bethlehem Steel Corp.	Burns Harbor	Beth-Elkhorn	No. 27	Dunham	Letcher	Kentucky	8	Kentucky	All-rail	5.52	5,000 ton-trainload	551	1.0
		Bethlehem Mines Corp.	Idamay	Idamay	Marion	West Virginia	3	Fairmont	All-rail		Single-car	505	NA
		Imperial Smokeless Coal Co.	Quinwood	Lee	Nicholas	West Virginia	7	Greenbrier	All-rail	5.77	5,000 ton-trainload	535	1.1
		Consolidation Coal Co.	Turkey Gap	Springton	Mercer	West Virginia	7	Pocahontas	All-rail	5.77	5,000 ton-trainload	577	1.0
		Old Ben Coal Corp.	No. 21	Sesser	Franklin	Illinois	10	Group 6	All-rail	2.99	5,000 ton-trainload	309	.96

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969—Continued

Oven-coke plant	Location of plant	Coal purchases: Name of company	Coal purchases: Name of mine	Mine location: Shipping point	Mine location: County	Mine location: State	Mine location: Coal producing district	Mine location: Freight rate district	Method of movement	Rate per ton	Transportation charges: Application	Transportation charges: Mileage	Rate per ton-mile (cents)
Kentucky													
Allied Chemical Corp.	Ashland	Semet-Solvey Div. (Allied)	Harewood	Harewood	Fayette	West Virginia	8	Kanawha	Rail-river	1.80	Rail to Huntington, W.Va. 1/ 86 cents-barge to plant	60	3.0 8/
		Semet-Solvey Div. (Allied)	Shannon Branch	Capels	McDowell	West Virginia	7	Tug River	Rail-river	1.96	----do----	125	1.6
		Semet-Solvey Div. (Allied)	Tralee	Tralee	Wyoming	West Virginia	7	Virginian	Rail-river	1.96	----do----	163	1.2
		Armco Steel Corp.	Robin Hood	Robin Hood	Boone	West Virginia	8	Kanawha	Rail-river	1.75	----do----	112	1.6
Maryland													
Bethlehem Steel Corp.	Sparrows Point	Consolidation Coal Co.	Crane Creek	McComas	Mercer	West Virginia	7	Pocahontas	Rail-tide (Balto)	5.78	Barge to Baltimore Harbor 2/3/	376	1.5
		Bethlehem Mines Corp.	Kayford	Kayford	Kanawha	West Virginia	8	Kanawha	Rail-tide (Balto)	6.10	----do----	449	1.4
		Bethlehem Mines Corp.	Century No. 101	Century	Barbour	West Virginia	3	Clarksburg	Rail-tide (Balto)	5.04	----do----	304	1.7
		Bethlehem Mines Corp.	No. 33	Ebensburg	Cambria	Pennsylvania	1	Clearfield	Rail-tide (Balto)	4.76	----do----	257	1.9
		Bethlehem Mines Corp.	No. 32	Revloc	Cambria	Pennsylvania	1	Clearfield	Rail-tide (Balto)	4.76	----do----	280	1.7
		Bethlehem Mines Corp.	No. 73	Johnstown	Cambria	Pennsylvania	1	Clearfield	Rail-tide (Balto)	4.76	----do----	260	1.8
		Bethlehem Mines Corp.	No. 58	Marianna	Washington	Pennsylvania	2	Westmoreland	Rail-tide (Balto)	5.37	----do----	307	1.7
		Bethlehem Mines Corp.	No. 41	Idamay	Marion	West Virginia	3	Fairmont	Rail-tide (Balto)	5.04	----do----	285	1.8
		Bethlehem Mines Corp.	No. 44	Century	Marion	West Virginia	3	Fairmont	Rail-tide (Balto)	5.04	----do----	304	1.7
		Beth-Elkhorn Corp.	No. 27	Dunham	Letcher	Kentucky	8	Elkhorn	Rail-tide (Balto)	6.10	----do----	425	1.4
		Beth-Elkhorn Corp.	No. 22	Deane	Letcher	Kentucky	8	Elkhorn	Rail-tide (Balto)	6.10	----do----	430	1.4
		Beth-Elkhorn Corp.	No. 24	Fenn	Pike	Kentucky	8	Elkhorn	Rail-tide (Balto)	6.10	----do----	425	1.4
		Island Creek Coal Co.	No. 10	Emmett	Logan	West Virginia	8	Logan	Rail-tide (Balto)	6.10	----do----	469	1.3
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	Virginian	Rail-tide (Balto)	5.78	----do----	378	1.5
		Slab Fork Coal Co.	Gaston No. 2	Alpoca	Wyoming	West Virginia	7	Virginian	Rail-tide (Balto)	5.78	----do----	403	1.4
		Ashland Mining Corp.	Ashland	Northfork	McDowell	West Virginia	7	Pocahontas	Rail-tide (Balto)	5.78	----do----	376	1.5
		Peerless Eagle Coal Co.	No. 1	Cornelia	Nicholas	West Virginia	8	New River	Rail-tide (Balto)	6.10	----do----	390	1.6
		New River Co.	No. 2	Lochgelly	Fayette	West Virginia	7	Virginian	Rail-tide (Balto)	5.78	----do----	384	1.5
Michigan													
Allied Chemical Corp.	Detroit	Semet-Solvay Div. (Allied)	Harewood	Harewood	Fayette	West Virginia	8	Kanawha	All-rail	5.53	5,000 ton-trainload	350	1.6
		Semet-Solvay Div. (Allied)	Tralee	Tralee	Wyoming	West Virginia	7	Virginian	All-rail	5.84	5,000 ton-trainload	495	1.2
		Semet-Solvay Div. (Allied)	Shannon Branch	Capels	McDowell	West Virginia	7	Pocahontas	All-rail	5.84	5,000 ton-trainload	515	1.2
		Jewell Ridge Coal Corp.	Jewell Valley	Jewell Valley	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.84	5,000 ton-trainload	525	1.2
		Westmoreland Coal Co.	Pine Branch	Pine Branch	Wise	Virginia	8	Clinch Valley No. 2	All-rail	5.53	5,000 ton-trainload	520	1.1
Ford Motor Co.	Dearborn	Eastern Coal Corp.	Eastern No. 8	Stone	Pike	Kentucky	8	Thacker	Rail-Lake Rail to Toledo 4/		Lake vessel charge $1.30 per ton	351	1.2
		Olga Coal Co	Olga	Susanna	McDowell	West Virginia	7	Tug River	----do----	4.34	----do----	394	1.1
		Carbon Fuel Co.	Carbon No. 6	West Carbon	Kanawha	West Virginia	8	Kanawha	----do----	4.14	----do----	309	1.3
		Island Creek Coal Co.	No. 27	Holden	Logan	West Virginia	8	Logan	----do----	4.14	----do----	394	1.1
		Winding Gulf Coals, Inc.	Clifftop No. 1	Clifftop	Fayette	West Virginia	7	Greenbrier	----do----	4.34	----do----	388	1.1
		Spruce River Coal Co.	No. 9A	Jeffrey	Boone	West Virginia	8	Kanawha	----do----	4.14	----do----	349	1.2
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	New River	----do----	4.34	----do----	382	1.1
		Consolidation Coal Corp.	Turkey Gap	Springton	Mercer	West Virginia	7	Pocahontas	----do----	4.34	----do----	426	1.0
Great Lakes Steel Corp.	Zug Island	Johnson-Elkhorn Coal Co.	Johnson Elkhorn	Airco	Floyd	Kentucky	8	Big Sandy	Rail-Lake Rail to Toledo 4/	4.14	Lake vessel charge $1.16 per ton	347	1.0
		Eastern Assoc. Coal Corp.	Keystone No. 2	Herndon	Wyoming	West Virginia	7	Virginian	----do----	4.34	----do----	396	1.1
		Eastern Assoc. Coal Corp.	Keystone No. 3	Herndon	Wyoming	West Virginia	7	Virginian	----do----	4.34	----do----	396	1.1
		Island Creek Coal Co.	No. 10	Emmett	Logan	West Virginia	8	Logan	----do----	4.14	----do----	371	1.1
		National Coal Mng. Co.	No. 25	Scarlett Glen	Mingo	West Virginia	8	Thacker	----do----	4.14	----do----	339	1.3
		Island Creek Coal Co.	No. 34	Mitchell Jct.	Mingo	West Virginia	8	Thacker	----do----	4.14	----do----	351	1.2
		Island Creek Coal Co.	No. 17	Mabley	Mingo	West Virginia	8	Thacker	----do----	4.14	----do----	351	1.2
		Pocahontas Empire	Jacob's Fork	Squire	McDowell	West Virginia	7	Pocahontas	----do----	4.34	----do----	394	1.1
Minnesota													
Koppers Co., Inc.	St. Paul	Eastern Assoc. Coal Corp.	Keystone No. 2	Herndon	Wyoming	West Virginia	7	Virginian	Rail-Lake Rail to Toledo 4/	3.79	Vessel-1.7%;Rail-1.80	396	1.0
		Island Creek Coal Co.	Beatrice	Grungy	Buchanan	Virginia	7	Upper Buchanan	----do----	3.79	----do----	384	1.0
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	----do----	3.79	----do----	396	1.0
		Eastern Assoc. Coal Corp.	Wharton No. 2	Wharton	Boone	West Virginia	8	Kanawha	----do----	3.61	----do----	349	1.0
U.S. Steel Corp.	Duluth	U.S. Steel Corp.	Cary No. 9	Filbert	McDowell	West Virginia	7	Pocahontas	Rail-Lake Rail to Toledo 4/	3.79	Vessel-1.7%	399	1.0 8/
		Clinchfield Coal Div. of the Pittston Co.	Moss No. 3	N & W RR	Russell	Virginia	8	Tiller	----do----	3.61	----do----	361	1.0 8/
		Buffalo Mining Co.	Buffalo	Lorado	Logan	West Virginia	8	Kanawha					

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969—Continued

Oven-coke plant	Location of plant	Coal purchases: Name of company	Coal purchases: Name of mine	Mine location: Shipping point	County	State	Coal producing district	Freight rate district	Transportation charges: Method of movement	Rate per ton	Application	Mileage	Rate per ton-mile (cents)
Missouri													
Great Lakes Carbon Corp.	St. Louis	Jewell Ridge Coal Corp.	Jewell Valley	Jewell Valley	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.35	5,000 ton-trainload	668	0.8
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	All-rail	4.75	5,000 ton-trainload	418	1.1
		Eastern Assoc. Coal Corp.	No. 4	Wharton	Boone	West Virginia	8	Kanawha	All-rail	5.04	5,000 ton-trainload	483	1.0
		Eastern Assoc. Coal Corp.	Kopperston No. 1	Kopperston	Wyoming	West Virginia	7	Virginian	All-rail	4.75	5,000 ton-trainload	418	1.1
		Imperial Colliery Co.	Imperial No. 8	Burnwell	Kanawha	West Virginia	8	Kanawha	All-rail	5.04	5,000 ton-trainload	486	1.0
New Jersey													
Koppers Co., Inc.	Kearney	Eastern Assoc. Coal Corp.	Wharton No. 2	Wharton	Boone	West Virginia	8	Kanawha	Rail-Tidewater Rail to Hampton Roads, Va. 1/	4.51	Vessel-1.41	490	1.2
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	----do----	4.40	----do----	378	1.2
		Eastern Assoc. Coal Corp.	Kopperston No. 2	Kopperston	Wyoming	West Virginia	8	Virginian	----do----	4.51	----do----	414	1.1
		Royalty Smokeless Coal Company	Premier	Premier	McDowell	West Virginia	7	Pocahontas	----do----	4.40	----do----	470	0.9
		Island Creek Coal Co.	Beatrice	Grundy	Buchanan	Virginia	7	Upper Buchanan	----do----	4.40	----do----	479	0.9
New York													
Allied Chemical Corp.	Buffalo	Semet-Solvey Div., Allied Chemical Corp.	Tralee	Tralee	Wyoming	West Virginia	7	Virginian	All-rail	6.62	5,000 ton-trainload	546	1.2
		Semet-Solvey Div., Allied Chemical Corp.	Shannon Branch	Capels	McDowell	West Virginia	7	Pocahontas	All-rail	6.62	5,000 ton-trainload	597	1.1
		Semet-Solvey Div., Allied Chemical Corp.	Harewood	Harewood	Fayette	West Virginia	8	Kanawha	All-rail	6.37	5,000 ton-trainload	496	1.3
		Island Creek Coal Co.	No. 10	Emmett	Logan	West Virginia	8	Kanawha	All-rail	6.37	5,000 ton-trainload	540	1.2
		Jewell Smokeless Coal Co.	No. 1	Coronet	Buchanan	Virginia	7	Pocahontas	All-rail	6.62	5,000 ton-trainload	577	1.1
		Clinchfield Coal Div., Pittston Co.	Moss No. 2	Clinchfield	Russell	Virginia	8	Tiller	All-rail	6.37	5,000 ton-trainload	617	1.0
		Imperial Smokeless Coal Co.	No. 2	Lee	Nicholas	West Virginia	7	Greenbrier	All-rail	6.62	5,000 ton-trainload	579	1.1
		Reitz Coal Co.	No. 4	Cairnbrook	Somerset	Pennsylvania	1	Somerset	All-rail	3.77	5,000 ton-trainload	259	1.4
		Spruce River Coal Co.	Spruce River	Jeffrey	Boone	West Virginia	8	Kanawha	All-rail	6.37	5,000 ton-trainload	503	1.3
		Carbon Fuel Co.	Carbon Nos. 9,20,29	Carbon	Kanawha	West Virginia	8	Kanawha	All-rail	6.37	5,000 ton-trainload	503	1.3
Bethlehem Steel Corp.	Lackawanna	Bethlehem Mines Corp.	No. 41	Nanty Glo	Cambria	Pennsylvania	1	Clearfield	All-rail	5.04	5,000 ton-trainload	217	2.3
		Bethlehem Mines Corp.	No. 32	Revloc	Cambria	Pennsylvania	1	Clearfield	All-rail	5.04	5,000 ton-trainload	217	2.3
		Bethlehem Mines Corp.	No. 51	Ellsworth	Washington	Pennsylvania	2	Westmoreland	All-rail	4.70	7,000 ton-trainload 2/	276	1.7
		Bethlehem Mines Corp.	No. 58	Marianna	Washington	Pennsylvania	2	Westmoreland	All-rail	4.70	7,000 ton-trainload 2/	276	1.7
		Bethlehem Mines Corp.	No. 60	Ellsworth	Washington	Pennsylvania	2	Westmoreland	All-rail	4.70	7,000 ton-trainload 2/	276	1.7
		Beth-Elkhorn Corp.	Hendryx No. 22	Deane	Letcher	Kentucky	8	Elkhorn	All-rail	6.37	5,000 ton-trainload	580	1.1
		Bethlehem Mines Corp.	No. 111	Shamrock	Kanawha	West Virginia	8	Kanawha	All-rail	6.37	5,000 ton-trainload	500	1.3
		Bethlehem Mines Corp.	Eunice	Eunice	Raleigh	West Virginia	8	Kanawha	All-rail	5.73	Single-car	504	1.1
		Clinchfield (Coal Div. of the Pittston Co.	Moss No. 2	Clinchfield	Russell	Virginia	8	Tiller	All-rail	6.37	5,000 ton-trainload	617	1.0
		Amherst Coal Co.	Amherst No. 1	Amherstdale	Logan	West Virginia	8	Tiller	All-rail	6.37	5,000 ton-trainload	540	1.2
Donner Hanna Coke Corp.	Buffalo	Clinchfield Coal Div. Pittston Co.	Moss No. 1	Moss	Dickinson	Virginia	8		All-rail	5.10	5,000 ton-trainload	487	1.0
		Westmoreland Coal Co.	Hampton No. 3	Hampton	Logan	West Virginia	8		All-rail	5.10	5,000 ton-trainload	416	1.2
		Amherst Coal Co.	Lundale No. 1	Amherstdale	Logan	West Virginia	8		All-rail	5.10	5,000 ton-trainload	540	0.9
		Crystal Block Coal Co.	Grapevine	Elda	Mingo	West Virginia	8		All-rail	5.25	5,000 ton-trainload	544	1.0
		Kentland-Elkhorn Coal Corp.	Spruce Fork	Biggs	Pike	Kentucky	8		All-rail	5.25	5,000 ton-trainload	577	0.9
		Consolidation Coal Co.	Hutchinson	Hutchinson	Westmoreland	Pennsylvania	2	Clearfield	All-rail	5.04	5,000 ton-trainload	313	1.6
		Barnes & Tucker Co.	Lancashire No. 24	Stiles Crossing	Cambria	Pennsylvania	1	Clearfield	All-rail	5.04	5,000 ton-trainload	217	2.3
		Consolidation Coal Co.	Champion	Champion	Allegheny	Pennsylvania	2	Clearfield	All-rail		5,000 ton-trainload	232	NA
		Reitz Coal Co.	Reitz	Cairnbrook	Somerset	Pennsylvania	1	Clearfield	All-rail	5.04	5,000 ton-trainload	259	1.9
Ohio													
Armco Steel Corp.	Hamilton	Armco Steel Corp.	No. 7	Montcoal	Raleigh	West Virginia	8	Kanawha	All-rail	4.06	5,000 ton-trainload	249	1.6
		Armco Steel Corp.	Robin Hood	Robin Hood	Boone	West Virginia	8	Kanawha	All-rail	4.06	5,000 ton-trainload	249	1.6
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	286	2.0
Armco Steel Corp.	Middletown	Armco Steel Corp.	No. 7	Montcoal	Raleigh	West Virginia	8	Kanawha	All-rail	4.06	5,000 ton-trainload	258	1.6
		Armco Steel Corp.	Robin Hood	Robin Hood	Boone	West Virginia	8	Kanawha	All-rail	4.06	5,000 ton-trainload	258	1.6
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	296	1.9

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969—Continued

Oven-coke plant	Location of plant	Coal purchases: Name of company	Coal purchases: Name of mine	Mine location: Shipping point	Mine location: County	Mine location: State	Mine location: Coal producing district	Mine location: Freight rate district	Transportation charges: Method of movement	Transportation charges: Rate per ton	Transportation charges: Application	Transportation charges: Mileage	Transportation charges: Rate per ton-mile (cents)
Ohio (continued)													
U.S. Steel Corp.	Lorain	U.S. Steel Corp.	Gary No. 14	Munson	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	441	1.4
		U.S. Steel Corp.	Gary No. 2	Wilcoe	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	441	1.4
		U.S. Steel Corp.	Gary No. 10	Wilcoe	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	441	1.4
		Island Creek Coal Co.	No. 27	Holden	Logan	West Virginia	8	Logan	All-rail	5.24	5,000 ton-trainload	468	1.4
		Island Creek Coal Co.	No. 10	Emmett	Logan	West Virginia	8	Logan	All-rail	5.24	5,000 ton-trainload	468	1.4
		U.S. Steel Corp.	Nos. 7 & 32	Lynch	Harlan	Kentucky	8	Harlan	All-rail	5.24	5,000 ton-trainload	520	1.0
		Leetown Coal Co.	Leetown	Grundy	Buchanan	Virginia	8	Thacker	All-rail	5.24	5,000 ton-trainload	391	1.3
		Leetown Coal Co.	Poplar Creek	Grundy	Buchanan	Virginia	8	Thacker	All-rail	5.24	5,000 ton-trainload	391	1.3
Detroit Steel Corp.	Portsmouth	Winding Gulf Coals, Inc.	East Gulf	East Gulf	Raleigh	West Virginia	7	New River	rail-barge-rail	2.10	Barge 40-45 cents 6/	143	1.4
		Winding Gulf Coals, Inc.	MacAlpine	MacAlpine	Raleigh	West Virginia	7	New River	Rail-barge-rail	2.10	Barge 40-45 cents 6/	143	1.4
		Winding Gulf Coals, Inc.	Tams	Tams	Raleigh	West Virginia	7	Virginian	Rail-barge-rail	2.10	Barge 40-45 cents 6/	143	1.4
		Crystal Block Coal & Coke Co.	Grapevine No. 7	Elia	Mingo	West Virginia	8	Thacker	Rail-barge-rail	1.97	Barge 40-45 cents 6/	6/	2.0
		Cook Alma Coal Corp.	Cook Alma	Spriggs	Mingo	West Virginia	8	Thacker	Rail-barge-rail	1.97	Barge 40-45 cents 6/	6/	2.0
Diamond Shamrock Corp.	Painesville	Island Creek Coal Co.	No. 9 B	Coal Mountain	Wyoming	West Virginia	8	Virginian	All-rail	5.24	5,000 ton-trainload	421	1.2
		Harman Mining Corp.	Harman	Harman	Buchanan	Virginia	8	Thacker	All-rail	5.41	Single-car	429	1.3
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	New River	All-rail	5.54	5,000 ton-trainload	408	1.4
Youngstown Sheet & Tube Co.	Campbell	Buckeye Coal Co.	Nemacolin	Nemacolin	Greene	Pennsylvania	2	Klondike	Barge-rail-barge	.62	Rail 1.31 7/	117	1.1
		Mathies Coal Co.	Mathies	Courtney	Washington	Pennsylvania	2	Westmoreland	Barge-rail-barge	.41	Rail 1.31 7/	117	2.0 8/
		Olga Coal Co.	Olga	Susanna	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	424	1.3
		Eastern Assoc. Coal Corp.	Kopperston No. 1	Kopperston	Wyoming	West Virginia	7	Virginian	All-rail	5.54	5,000 ton-trainload	408	1.4
		Woodruff Coal Co.	Bane	B & W #8	Pike	Kentucky	8	Kentucky	All-rail	5.24	5,000 ton-trainload	450	1.2
Republic Steel Corp.	Cleveland	Island Creek Coal Co.	Holden	Holden	Logan	West Virginia	8	Logan	All-rail	5.24	5,000 ton-trainload	366	1.4
		Republic Steel Corp.	Russellton	Russellton	Allegheny	Pennsylvania	2	Pittsburgh	All-rail	4.44	5,000 ton-trainload	131	3.4
		Republic Steel Corp.	Newfield	Verona	Allegheny	Pennsylvania	2	Pittsburgh	All-rail	4.44	5,000 ton-trainload	131	3.4
		Republic Steel Corp.	No. 4	Van Meter	Westmoreland	Pennsylvania	2	Westmoreland	All-rail	4.44	5,000 ton-trainload	185	2.4
		Beatrice Pocahontas Co.	Beatrice	Grundy	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.54	5,000 ton-trainload	391	1.4
		Westmoreland Coal Co.	Hampton No. 8	Hampton	Boone	West Virginia	9	Kanawha	All-rail	5.24	5,000 ton-trainload	376	1.4
		Republic Steel Corp.	Republic	Marrowbone	Pike	Kentucky	8	Kentucky	All-rail	5.41	5,000 ton-trainload	393	1.4
Republic Steel Corp.	Massillon	Republic Steel Corp.	Russellton	Russellton	Allegheny	Pennsylvania	2	Pittsburgh	All-rail		5,000 ton-trainload	131	NA
		Republic Steel Corp.	Van Meter	Van Meter	Westmoreland	Pennsylvania	2	Westmoreland	All-rail	4.42	Single-car	154	2.9
		Winding Gulf Coals, Inc.		East Gulf	Raleigh	West Virginia	7	New River	All-rail	5.54	5,000 ton-trainload	326	1.7
Republic Steel Corp.	Warren	Republic Steel Corp.	No. 4	Van Meter	Westmoreland	Pennsylvania	2	Westmoreland	All-rail	3.50	5,000 ton-trainload	119	2.9
		Republic Steel Corp.	Russellton	Russellton	Allegheny	Pennsylvania	2	Pittsburgh	All-rail	3.41	5,000 ton-trainload	65	5.2
		Republic Steel Corp.	Clyde	Fredericktown	Washington	Pennsylvania	2	Westmoreland	All-rail	3.62	5,000 ton-trainload	112	3.2
		Beatrice Pocahontas Co.	Beatrice	Grundy	Buchanan	Virginia	7	Upper Buchanan	All-rail	5.54	5,000 ton-trainload	413	1.3
Republic Steel Corp.	Youngstown	Republic Steel Corp.	No. 4	Van Meter	Westmoreland	Pennsylvania	2	Westmoreland	All-rail	3.50	5,000 ton-trainload	119	2.9
		Republic Steel Corp.	Clyde	Fredericktown	Washington	Pennsylvania	2	Westmoreland	All-rail	3.62	5,000 ton-trainload	119	3.0
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	New River	All-rail	5.54	5,000 ton-trainload	481	1.5
		Winding Gulf Coals, Inc.	Tams	Tams	Raleigh	West Virginia	7	Virginian	All-rail	5.54	5,000 ton-trainload	481	1.5
Allied Chemical Corp.	Ironton	Semet-Solvay Div.	Harewood	Harewood	Fayette	West Virginia	6	Logan	Rail-barge-rail	1.97	Barge 40-60 cents 1/	58	3.4
Semet-Solvay Div.		Semet-Solvay Div.	Tralee	Tralee	Wyoming	West Virginia	7	Virginian	Rail-barge-rail	2.10	Barge 40-50 cents 1/	199	1.0
		Semet-Solvay Div.	Shannon Branch	Capels	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.10	Barge 40-50 cents 1/	139	1.5
		Island Creek Coal Co.	No. 93	Coal Mountain	Wyoming	West Virginia	7	Virginian	Rail-barge-rail	1.47	Barge 40-50 cents 1/	139	1.1
		Leckie Smokeless Coal Co.	Anjean No. 5	Watts	Greenbrier	West Virginia	7	Greenbrier	Rail-barge-rail	2.10	Barge 40-50 cents 1/	133	1.6
		Carbon Fuel Co.	Mac 20	South Carbon	Kanawha	West Virginia	8	Kanawha	Rail-barge-rail	2.10	Barge 40-50 cents 1/	75	2.8
Interlake Steel Corp.	Toledo	Olga Coal Co.	Olga	Susanna	McDowell	West Virginia	7	Pocahontas	All-rail	5.54	5,000 ton-trainload	408	1.4
		Davis Coal Co., Inc.	No. 1	Kermit	Mingo	West Virginia	8	Thacker	All-rail	5.24	5,000 ton-trainload	384	1.5
		Island Creek Coal Co.	Spurlock	Dalistor,	Floyd	Kentucky	8	Big Sandy	All-rail	5.24	5,000 ton-trainload	377	1.4
Pennsylvania													
Pittsburgh Steel Co.	Monessen	Bird Coal Co.	Bird No. 3	Johnstown	Somerset	Pennsylvania	1	Somerset	Rail-barge-rail	1.40	Barge 40 cents per ton	85	1.6 9/
		Consolidation Coal Co.	Hutchinson	Hutchinson	Westmoreland	Pennsylvania	2	Westmoreland	Truck		Approx. 30 cents per ton	35	.9
		Gateway Coal Co.	Gateway	Clarksville	Greene	Pennsylvania	2	Klondike	Barge		Approx. 40 cents per ton	60	.6
		Consolidation Coal Co.	Newhall	Pageton	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents 1/	199 - 267	1.0

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969—Continued

Oven-coke plant	Location of plant	Coal purchases: Name of company	Coal purchases: Name of mine	Mine location: Shipping point	Mine location: County	Mine location: State	Mine location: Coal producing district	Mine location: Freight rate district	Transportation charges: Method of movement	Transportation charges: Rate per ton	Transportation charges: Application	Transportation charges: Mileage	Transportation charges: Rate per ton-mile (cents)
Pennsylvania (continued)													
Shenango, Inc.	Neville	Gateway Coal Co.	Gateway	Clarksville	Greene	Pennsylvania	2	Pittsburgh	All-river		Approx. 60 cents per ton	40	1.5
		Buckeye Coal Co.	Nemacolin	Nemacolin	Greene	Pennsylvania	2	Pittsburgh	All-river		----do----	40	1.5
		Consolidation Coal Co.	Hutchinson	Hutchinson	Westmoreland	Pennsylvania	2	Westmoreland	All-river		----do----	40	1.5
		Amherst Coal Co.	Landale No. 1	Amerstdale	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 40-50 cents per ton 1/	40	1.0
		Winding Gulf Coal Co.	East Gulf	Raleigh	Raleigh	West Virginia	7	New River	Rail-barge-rail	2.00	Barge 40-50 cents per ton 1/	40	1.0
		Slab Fork Coal Co.	Slab Fork	Slab Fork	Raleigh	West Virginia	7	Virginian	Rail-barge-rail	2.00	Barge 40-50 cents per ton 1/	40	1.0
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 40-50 cents per ton 1/	40	1.0
		Eastern Assoc. Coal Corp.	Wharton No. 2	Wharton	Boone	West Virginia	8	Kanawha	Rail-barge-rail	1.66	Barge 40-50 cents per ton 1/	40	1.0
U.S. Steel Corp.	Clairton	U.S. Steel Corp.	Bohena	Poland	Greene	Pennsylvania	2		All-river		Approx. 60 cents per ton	35	1.7
		U.S. Steel Corp.	Maple Creek	New Creek	Washington	Pennsylvania	2		All-river		----do----	35	1.7
		U.S. Steel Corp.	Gary No. 1	Wilcoe	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/	134 + 267	1.4
		U.S. Steel Corp.	Gary No. 2	Wilcoe	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/	134 + 267	1.4
		U.S. Steel Corp.	Gary No. 9	Filbert	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/	134 + 267	1.4
		U.S. Steel Corp.	Gary No. 10	Wilcoe	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/	134 + 267	1.4
		U.S. Steel Corp.	Gary No. 14	Munson	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/	134 + 267	1.4
		U.S. Steel Corp.	Gary No. 17	Gary	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/	134 + 267	1.4
		U.S. Steel Corp.	Gary Countour	Gary	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	Barge 60 cents per ton 1/	134 + 267	1.4
		Buffalo Mining Co.	Lorado		Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 60 cents per ton 1/	106 + 267	
		Westmoreland Coal Co.	Hampton No. 3		Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 60 cents per ton 1/	206 + 267	
		Amherst Coal Co.	McGregor		Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 60 cents per ton 1/	106 + 267	
		Amherst Coal Co.	Amherst No. 4		Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge 60 cents per ton 1/	106 + 267	
U.S. Steel Corp.	Fairless	Amherst Coal Co.	Landale No. 1	Amherstdale	Logan	West Virginia	8	Logan	All-rail	6.80	5,000 ton-trainload	565	1.2
		Amherst Coal Co.	Amherst No. 4	Amherstdale	Logan	West Virginia	8	Logan	All-rail	6.80	5,000 ton-trainload	565	1.2
		Clinchfield Coal, Div. Pittston Co.	Moss No. 2	Clinchfield	Russell	Virginia	8	Tiller	All-rail	6.80	5,000 ton-trainload	636	1.1
		U.S. Steel Corp.	Gary No. 14	Munson	McDowell	West Virginia	7	Pocahontas	All-rail	6.47	5,000 ton-trainload	524	1.2
		Gauley Coal & Coke Co.	Donegan No. 10	Donegan No. 10	Nicholas	West Virginia	3	Gauley	All-rail	5.51	5,000 ton-trainload	560	1.0
Alan Wood Steel Co.	Swedeland	Consolidation Coal Co.	Lynco	Lynco	Wyoming	West Virginia	7	Virginian	All-rail	6.47	5,000 ton-trainload	545	1.2
		Consolidation Coal Co.	Buckeye	Stephenson	Wyoming	West Virginia	7	Virginian	All-rail	6.47	5,000 ton-trainload	494	1.3
		Bird Coal Co.	Bird No. 2	Johnstown	Somerset	Pennsylvania	1	Somerset	All-rail	5.29	5,000 ton-trainload	254	2.1
		Crystal Block Coal Co.	Grapevine No. 8	Elda	Mingo	West Virginia	8	Thacker	All-rail	5.60	5,000 ton-trainload	552	1.0
		Kentland-Elkhorn Coal Corp.	Spruce Fork	Phelps	Pike	Kentucky	8	Thacker	All-rail	6.76	5,000 ton-trainload	590	1.1
		Reitz Coal Co.	Reitz No. 4	Clairnbrook	Somerset	Pennsylvania	1	Somerset				212	NA
		Bethlehem Mines Corp.	No. 51	Ellsworth	Washington	Pennsylvania	2	Westmoreland	All-rail			15	NA
Bethlehem Steel Corp.	Bethlehem	Bethlehem Mines Corp.	Nanty Glo No. 31	Nanty Glo	Cambria	Pennsylvania	1	Clearfield	All-rail	5.23	5,000 ton-trainload	251	1.9
		Bethlehem Mines Corp.	Revloc No. 32	Revloc	Cambria	Pennsylvania	1	Clearfield	All-rail	5.23	5,000 ton-trainload	271	1.9
		Bethlehem Mines Corp.	Cambria Slope No. 33	Ebensburg	Cambria	Pennsylvania	1	Clearfield	All-rail	5.23	5,000 ton-trainload	366	1.4
		Bethlehem Mines Corp.	Idamay No. 44	Idamay	Marion	West Virginia	3	Gauley	All-rail	5.51	5,000 ton-trainload	359	1.5
		Gauley Coal & Coke Co.	Tioga No. 1	Tioga	Nicholas	West Virginia	3	Gauley	All-rail	5.51	5,000 ton-trainload	481	1.1
Bethlehem Steel Corp.	Johnstown	Bethlehem Mines Corp.	Ellsworth No. 51	Ellsworth	Washington	Pennsylvania	2	Westmoreland	All-rail	3.25	7,000 ton-trainload	102	3.2
		Bethlehem Mines Corp.	Marianna No. 58	Marianna	Washington	Pennsylvania	2	Westmoreland	All-rail	3.25	7,000 ton-trainload	102	3.2
		Bethlehem Mines Corp.	Somerset No. 60	Cokeburg	Washington	Pennsylvania	2	Westmoreland	All-rail	3.25	7,000 ton-trainload	102	3.2
		Bethlehem Mines Corp.	Nos. 31, 32	Ebensburg	Cambria	Pennsylvania	1	Clearfield	All-rail	NA	5,000 ton-trainload	43	NA
		Bethlehem Mines Corp.	No. 41	Barrackville	Marion	West Virginia	3	Fairmont	All-rail	3.59	5,000 ton-trainload	141	2.5
Eastern Gas & Fuel Assoc.	Philadelphia	Eastern Assoc. Coal Corp.	Keystone No. 2	Herndon	Wyoming	West Virginia	7	Virginian	All-rail	6.84	Single-car	491	1.4
		Eastern Assoc. Coal Corp.	Wharton No. 2	Wharton	Boone	West Virginia	8	New River	All-rail	7.16	Single-car	537	1.3
		Eastern Assoc. Coal Corp.	Kopperston No. 2	Kopperston	Wyoming	West Virginia	8	Virginian	All-rail	7.16	Single-car	538	1.3
Jones & Laughlin	Aliquippa	Jones & Laughlin Steel Corp.	Shannopin	Poland	Greene	Pennsylvania	2	Klondike	All-river		Approx. 55 cents per ton	35	1.6
		Jones & Laughlin Steel Corp.	Vesta No. 4	Labelle	Washington	Pennsylvania	2	Westmoreland	All-river		Approx. 65 cents per ton	35	1.8
		Jones & Laughlin Steel Corp.	Vesta No. 5	Labelle	Washington	Pennsylvania	2	Westmoreland	All-river		Approx. 65 cents per ton	33	1.8
		Consolidation Coal Co.	Crane Creek	McComas	Mercer	West Virginia	7	Pocahontas	Rail-barge-rail	2.16	Barge-55 cents per ton 1/	171 + 267	.8
		Consolidation Coal Co.	Turkey Gap	Springton	Mercer	West Virginia	7	Pocahontas	Rail-barge-rail	2.16	Barge-55 cents per ton 1/	171 + 267	.8
		United Pocahontas Coal Co.	Indian Ridge No. 6	Crumpler	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.16	Barge-55 cents per ton 1/	171 + 267	.8
		Buffalo Mining Co.	Lorado	Lorado	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	Barge-55 cents per ton 1/	106 + 267	.7
		Ranger Fuel Corp.	Barrett	Barrett	Boone	West Virginia	8	Kanawha	Rail-barge-rail	1.66	Barge-55 cents per ton 1/	104 + 267	.7

TABLE A-1. - Bituminous coal received at oven-coke plants in the United States, 1969—Continued

Oven-coke plant	Location of plant	Coal purchases: Name of company	Coal purchases: Name of mine	Mine location: Shipping point	County	State	Coal producing district	Freight rate district	Method of movement	Rate per ton	Transportation charges: Application	Mileage	Rate per ton-mile (cents)
Pennsylvania (continued)													
Jones & Laughlin Steel Corp.	Pittsburgh	Jones & Laughlin Steel Corp.	Shannopin	Poland	Greene	Pennsylvania	2	Klondike	All-river		Approx. 65 cents per ton	35	1.8
		Jones & Laughlin Steel Corp.	Vesta No. 4	Labelle	Washington	Pennsylvania	2	Westmoreland	All-river		Approx. 65 cents per ton	35	1.8
		Jones & Laughlin Steel Corp.	Vesta No. 5	Labelle	Washington	Pennsylvania	2	Westmoreland	All-river		Approx. 65 cents per ton	35	1.8
		Consolidation Coal Co.	Crane Creek	McComas	Mercer	West Virginia	7	Pocahontas	Rail-barge-rail	2.06	Barge-65 cents per ton 1/	447	.5
		Consolidation Coal Co.	Turkey Gap	Springton	Mercer	West Virginia	7	Pocahontas	Rail-barge-rail	2.06	----do----	447	.5
		United Pocahontas Coal Co	Indian Ridge No. 6	Crumpler	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.06	----do----	447	.5
		Buffalo Mining Co.	Lorado	Lorado	Logan	West Virginia	8	Pocahontas	Rail-barge-rail	2.06	----do----	347	.6
Crucible, Inc.	Midland	Island Creek Coal Co.	Wheelright	Price	Floyd	Kentucky	8	Big Sandy	Rail-barge-rail	2.16	Barge-56 cents per ton 1/	342	.6
		Island Creek Coal Co.	No. 10	Emmett	Logan	West Virginia	8	Logan	Rail-barge-rail	2.16	----do----	447	.5
		Island Creek Coal Co.	No. 27	Holden	Logan	West Virginia	8	Logan	Rail-barge-rail	2.16	----do----	447	.5
		Island Creek Coal Co.	Va. Pocahontas	Oakwood	Buchanan	Virginia	7	Upper Buchanan	Rail-barge-rail	2.00	----do----	446	.5
		Beatrice Pocahontas Co.	Beatrice	Oakwood	Buchanan	Virginia	7	Upper Buchanan	Rail-barge-rail	2.00	----do----	446	.5
Tennessee													
Woodward Iron Co.	Chattanooga	Coal Processing Corp.	Dixiana	Dixiana	Wise	Virginia	8	Clinch Valley No. 2	All-rail	3.81	Single-car	245	1.6
		Consolidation Coal Co.	Buckeye	Stephenson	Wyoming	West Virginia	7	Virginian	All-rail	5.07	Single-car	372	1.4
Texas													
Armco Steel Corp.	Houston	Armco Steel Corp.	Robin Hood	Robin Hood	Boone	West Virginia	8	Kanawha	Rail-barge-rail	1.48	Barge-3.20 1/	1,395	.3
		United Pocahontas Coal Co.	Indian Ridge No. 8	Crumpler	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.16	Barge-3.20 1/	1,131	.3
		Evans Coal Co.	Evans	Bokoshi	Haskell	Oklahoma	14	Stigler	All-rail	4.60	Minimum of 1,000 tons	465	.9
Lone Star Steel Co.	Daingerfield	Imperial Smokeless Coal Co.	Quinwood No. 2	Lee	Nicholas	West Virginia	7	New River	Rail-barge-rail	1/1.98	Barge-2.90; rail-3.44		
		Peabody Coal Co.	Rogers County	Claremore	Rogers	Oklahoma	15	Broken Arrow	All-rail	5.67	Single-car	337	.9
		Garland Coal Co.	Garland	Stigler	Haskell	Oklahoma	14	Stigler	All-rail	5.96	Single-car	241	3.0
Utah													
U.S. Steel Corp.	Geneva	Mid-Continent Coal and Coke Co.	Dutch Creek	Carbondale	Pitken	Colorado	16	Carbondale	All-rail	3.76	Volume-Minimum 6,900 tons per week	371	.7
		U.S. Steel Corp.	Geneva	Horse Canyon	Emery	Utah	20	Emery	All-rail	2.08	Trainload-Minimum 3,100 ton	150	1.3
		U.S. Steel Corp.	Somerset	Somerset	Gunnison	Colorado	16	Crested Butte	All-rail	4.64	Trainload ----do----	378	.9
West Virginia													
Wheeling Pittsburgh Steel Corp.	East Steubenville	Harmar Coal Co.	Harmar	Harmarville	Allegheny	Pennsylvania	2	Pittsburgh	Barge-Allegheny River		50 cents per ton	40	1.4
		Amigo Smokeless Coal Co.	Wyco	Wyco	Wyoming	West Virginia	7	Virginian	Rail-barge-rail	2.00	Barge-Approx. $1.05 per ton	416	.4
		Major Elkhorn Coal Co.	Major Elkhorn	Kite	Letcher	Kentucky	8	Elkhorn	Rail-barge-rail	1.66	----do----	462	NA
		Eastern Assoc. Coal Corp.	Colver	Colver	Cambria	Pennsylvania	1	Clearfield	Rail-barge-rail	1.38	----do----	140	.4
		Kitchekan Pocahontas Coal Mining Co.	Kitchekan	Moss Mills	Mercer	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	----do----	106 + 217	1.8
		Amherst Coal Co.	Lundale No. 1	Amherstdale	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	----do----	106 + 217	1.5
		Omar Mining Corp.	Omar No. 15	Omar	Logan	West Virginia	8	Logan	Rail-barge-rail	1.66	----do----	106 + 217	1.6
		Alma Coal Corp.	Alma	Pikeville	Pike	Kentucky	8	Thacker	Rail-barge-rail	1.66	----do----	131 + 217	1.3
		Eastern Assoc. Coal Corp.	Keystone No. 1	Keystone	McDowell	West Virginia	7	Pocahontas	Rail-barge-rail	2.00	----do----	139 + 217	1.4
Sharon Steel Crop.	Fairmont	Eastern Assoc. Coal Corp.	Keystone No. 1	Vivian	McDowell	West Virginia	7	Pocahontas	All-rail	3.68	Single-car	329	1.1
		Joanne Coal Co.	Joanne	Rachel	Marion	West Virginia	3	Fairmont	All-rail	.58	Single-car	20	2.9
National Steel Corp.	Weirton	National Mines Corp.	Isabella	Isabella	Fayette	Pennsylvania	2	Pittsburgh	All-river	.69	Minimum 4,000 tons	115	.6
		Mathies Coal Co.	Mathies	Courtney	Washington	Pennsylvania	2	Pittsburgh	All-river	.69	Minimum 4,000 tons	105	.7
		Itmann Coal Co.	Itmann	Itmann	Wyoming	West Virginia	7	Virginian	Rail-barge/rail	2.00	Barge Approx. $1.05 per ton	349	.9
		Jewell Ridge Coal Corp.	No. 3	Seng Camp	Buchanan	Virginia	7	Buchanan	Rail-barge/rail	2.00	Barge Approx. $1.05 per ton	359	.9
Wisconsin													
Milwaukee Solvay Coke Div., Pickands Mather	Milwaukee	Amherst Coal Co.	Lundale No. 1	Amherstdale	Logan	West Virginia	8	Logan	Rail-Lake 4/ Rail	4.13	7,200 tons trainload-Vessel-2.40	961	1.1
		United Pocahontas Coal Co.	Indian Ridge No. 6	Crumpler	McDowell	West Virginia	7	Pocahontas	Rail-Lake 4/ Rail	4.33	----do----	426	1.0
		Island Creek Coal Co.	Beatrice	Grundy	Buchanan	Virginia	7	Buchanan	Rail-Lake 4/ Rail	4.33	----do----	384	1.1
		Imperial Elkhorn Coal Co.	Calora	Ligon	Floyd	Kentucky	8	Big Sandy	Rail-Lake 4/ Rail	4.13	----do----	538	.8
		Kentland-Elkhorn Coal Corp.	Spruce Fork	Biggs	Pike	Kentucky	8	Thacker	Rail-Lake 4/ Rail	4.13	----do----	384	1.1
		Cannelton Coal Co.	No. 8	Cannelton	Fayette	West Virginia	8	Kanawha		4.33	----do----	432	1.4
		Cannelton Coal Co.	No. 3	Superior	McDowell	West Virginia	7	Pocahontas		4.33	----do----	394	1.1

1/ Charge for dumping coal into barges is approximately 20 cents per ton.
2/ Includes dumping of coal into barges.
3/ The contract charge for barging coal to Sparrows Point is approximately 22-24 cents per ton.
4/ Charge for dumping coal into vessels is 23 cents per ton.
5/ Subject to minimum of 600,000 tons annually from mines at Ellsworth and Marianna.
6/ Subject to minimum of 750,000 tons annually.
7/ Rate for transferring coal from barges to railroad car--23 cents per ton.
8/ Approx. rail distances and rail rate.

NOTE: Railroad rates include Ex Parte 267A freight rate increase which became effective November 1970.

TABLE A-2. - Transportation cost characteristics of bituminous coal shipped to selected consumers 1/

To	Origin point or district 2/	Min. trainload tonnages	Min. annual tonnage	Rate per ton in cents incl. X-ing	Mileage	Rate per ton mile in cents	RR or shipper owned equipment	Tariff reference number 3/	Coal dist.	Average B.T.U. per pound
Alabama										
Tallassee	Corbin, Ala.	4,000	1st. 500,000	153	128	1.195	RR	SFTB 838	13	13,386
		4,000	Next 500,000	138	128	1.078	RR		13	13,386
		4,000	Next 500,000	112	128	.875	RR		13	13,386
		4,000	Excess	90	128	.703	RR		13	13,386
	Parish, Ala.	5,000	1,400,000	124	131	.947	RR	SOU 261	13	13,386
		6,000	1,750,000	119	131	.882	RR		13	13,386
		7,000	2,000,000	113	131	.837	RR		13	13,386
	Scottsboro, Ala.	1,600	475,000	106	68	1.559	RR	SOU 260	13	13,386
		2,500	750,000	91	68	1.338	RR		13	13,386
		2,500	945,000	89	68	1.309	RR		13	13,386
		3,200	950,000	86	68	1.265	RR		13	13,386
California										
Valley	York Canyon, N.M.	4,000	500,000	734	1,100	.722	RR	ATSF 15641-E	18	11,749
			700,000	662	1,100	.620	RR	ATSF 15641-E	18	11,749
			Excess	573	1,100	.515	RR	ATSF 15641-E	18	11,749
	Sunnyside, Utah	4,000	700,000	147	1,373	.598	RR	SRGW T509-B	19	10,860
Long Beach	Sunnyside, Utah	4,000		486	1,349	.434	RR	SRGW T919-B	19	10,860
Connecticut										
Bridgeport	Clearfield Dist.	7,000		491	430	1.142	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		420	604	.861	RR	ICC G-113	2	13,336
	Cauley Dist.			537	715	.751	RR	ICC G-113	3	13,496
Devon	Clearfield Dist.	7,000		408	501	.814	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		441	608	.725	RR	ICC G-113	2	13,336
Hartford	Clearfield Dist.	7,000		407	471	.864	RR	ICC G-113	1	13,612
	Westmoreland Dist.			439	645	.681	RR	ICC G-113	2	13,336
Middletown	Clearfield Dist	7,000		556	471	1.180	RR	ICC G-113	1	13,612
	Westmoreland Dist.			484	645	.805	RR	ICC G-113	2	13,336
	Cauley Dist.			627	756	.829	RR	ICC G-113	3	13,496
Westville	Clearfield Dist.	7,000		598	551	1.134	RR	ICC G-113	1	13,612
	Westmoreland Dist.			479	708	.675	RR	ICC G-113	2	13,336
	Cauley Dist.			456	613	.744	RR	ICC G-113	3	13,496
New Haven	Clearfield Dist.	7,000		406	351	1.157	RR	ICC G-113	1	13,612
	Westmoreland Dist.			439	708	.620	RR	ICC G-113	2	13,336
	Cauley Dist.			456	613	.745	RR	ICC G-113	3	13,496
Delaware										
Dover	Clearfield Dist.	7,000		461	322	1.432	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		448	457	1.072	RR	ICC G-113	2	13,336
Millsboro	Clearfield Dist.	7,000		461	352	1.310	RR	ICC G-113	1	13,612
	Westmoreland Dist.			448	473	1.098	RR	ICC G-113	2	13,336
Wilmington	Clearfield Dist.	7,000		437	277	1.578	RR	ICC G-113	1	13,612
	Westmoreland Dist.			469	413	1.136	RR	ICC G-113	2	13,336
	Cauley Dist.			467	525	.889	RR	ICC G-113	3	13,496
District of Columbia										
Benning, D.C.	Clearfield Dist.	7,000		400	295	1.356	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		429	368	1.166	RR	ICC G-113	2	13,336
	Cauley Dist.	7,000		464	479	.969	RR		3	13,496
	Thacker Dist.	7,000		538	326	1.646	RR		8	13,663
Georgia										
Chattanooga	Dayton, Tenn.	5,000		329	280	1.175	RR	SFTB 970-B ICC S-757	8	13,663
Atlanta	Western, Ky.	7,000		457	432	1.032	RR		9	12,285
Augusta	Allen, Va.	5,000	1,500,000	356	385	.925	RR	SFTB 1123	8	13,663
Harlee	Avon, Tenn.	5,000	500,000	232	442	.480	Shipper	SOU 220-A	8	13,663
		10,000	1,400,000	232	442	.417	Shipper		8	13,663
Jesse	Lewis, Ky.	7,000	1,400,000	205	367	.559	RR	SFTB 914-B	8	13,663
Mitchell	Alva, Ky.	2,500	525,000	443	665	.666	RR	SFTB 954-B	8	13,663
	Whiteside, Tenn.		225,000	448	448	1.000	RR		8	13,663
Milledgeville	Avon, Tenn.	10,000		235	312	.753	RR		13	13,386
	Harlan Dist.	7,000		580	275	1.298	RR	SFTB 997-A ICC S-759	13 8	13,386 13,663
Port Wentworth	Kanawha Dist.	7,000		693	684	1.091	RR		8	13,663
Illinois										
Federal	Peery, Ill.	5,000	1,000,000	73	85	.859	Shipper	SM & O 3896-D	10	11,400
Joliet	Peery, Ill.	10,000		120	300	.400	Shipper		10	11,400
	Montana	10,000		700	1,200	.583	Shipper		22	10,280
	Bellville Dist.	5,000		263	238	.685	RR		10	11,400
Joppa	Central Illinois	5,400	1,000,000	105	61	1.721	RR	C & E1 104	10	11,400
		5,400	1,500,000	101	61	1.656	RR	C & E1 104	10	11,400
Pekin	Taylorville, Ill.	4,000		140	75	1.867	Shipper		10	11,400
Peoria	Cuba, Ill.	2,000		98					10	11,400
	Canton	1,000		110					10	11,400
Pinkneyville	Perry, Ill.	7,000	1,500,000	170	108	.752	Shipper	SM & O 3893-E	10	11,400
Rockford	Franklin-Williamson Dist. (Ill.)	5,000		443	310	1.429	RR		10	11,400
Venice	Belleville Dist. (Ill.)	10,000		139	54	1.655	RR		10	11,400
Waukegan	Fulton, Co., Ill.	9,000	900,000	193	285	.818	RR	C & NW 17160-H	10	11,400
	Peery, Ill.	10,000	1,600,000	231	341	.677	Company	SM & O 3897-C	10	11,400
	Carlinsville, Ill.	10,000		288	150	1.907	Company		10	11,400
	Freeburg, Ill.	5,000		324	264	1.227	RR		10	11,400
Indiana										
Ballytown	Booneville, Ind.	6,000	400,000	214	350	.650		SOU 211	11	11,490
		9,000	1,000,000	203	350	.594			11	11,490
Campbells	Sandborn, Ind.	4,500	700,000	187	70	2.671	RR	L & N 5078	11	11,490
Cayuga	Clinton-Brazil Dist. (Ind.)	10,000	2,500,000	40	22	1.818	Shipper	L & N 5078	11	11,490
		10,000	2,000,000	47	22	2.136	or	L & N 5078	11	11,490
		6,000	1,000,000	59	22	2.682	company	L & N 5078	11	11,490
Centerton	Sandborn, Ind.	4,500	700,000	175	100	1.750	RR	L & N 5078	11	11,490
Dana	Winslow, Ind.			354	170	2.083	RR		11	11,490
E. Chicago	Springfield, Ill.	10,000	1,500,000	252	215	1.172	RR	IC 3347-C	10	11,400
		10,000	1,500,000	334	215	1.557	RR	IC 3347-C	10	11,400
		10,000	1,500,000	247	215	1.149	Shipper	IC 3347-C	10	11,400
Edwardsport	Sandborn, Ind.			48	24	1.667		PRR 33-13-B	11	11,490
Fayette	Linton-Sullivan Dist. (Ind.)	1,000		154	38	4.053	RR	CMSTPP 18590-C	11	11,490
		2,500	500,000	104	38	2.737	RR	CMSTPP 18590-C	11	11,490
		1,400	748,000	91	38	2.395	RR	CMSTPP 18590-C	11	11,490
		1,900	1,300,000	88	38	2.316	RR	CMSTPP 18592-P	11	11,490
		4,500	1,500,000	86	38	2.263	RR	CMSTPP 18592-P	11	11,490
		7,000	2,000,000	81	38	2.132	RR	CMSTPP 18592-P	11	11,490
		7,200	2,250,000	79	38	2.079	RR	CMSTPP 18592-P	11	11,490
Gary	Avon, W. Va.	7,200		170	108	1.122	RR	C & O 30635	7	14,040
	Sand Patch, Pa.	7,200		195	195	1.000	RR	B & O C-150	7	14,040
	Lynch, Ky.	7,200	1,800,000	170	108	.953	RR	SFTB 968-A	7	14,040
		5,000	1,800,000	401	108	1.009	RR			
	Booneville, Ind.	10,000		253	342	.730	RR		11	11,490
	Cato, Ind.	10,000		203	278	.730	RR		11	11,400
	Southern Illinois	10,000		251	320	.784			10	11,400
Hammond	Gallup, New Mexico	5,000		1,120	1,466	.764	Shipper or company	AT & SF 15530-C	18	11,749
	Booneville, Ind.	10,000		166	289	.574	RR	PC 338-A ICC 2339	11	11,490
Indiana Harbor	Seaver, Ill.	12,500	1,500,000	189	268	.680	RR	IC 3351	10	11,400
Indianapolis	Princeton Dist. (Ind.)	4,300	700,000	233	192	1.214	RR	PC 325	11	11,490
		4,300	700,000	247	153	1.647	RR		11	11,490
	Sandborn, Ind.	1,300	240,000	208	90	2.311	RR		11	11,490
	Clinton-Brazil Dist.	1,300	240,000	208	90	2.311	RR		11	11,490
Lotts	Dugger, Ind.	7,200	2,240,000	68	71	1.943	RR		11	11,490
Petersburg	Lynnville Mine, Ind.	4,300	1,500,000	51	24	1.962	Shipper or company	PC-C4-A	11	11,490
Porter	Princeton-Ayshire Dist.	10,300		203	277	.752	RR		11	11,490
St. Joseph	Clinton-Brazil	10,300		185	274	1.642	RR		11	11,490
	Princeton-Ayshire	7,000		410	355	1.419	RR		11	11,490

TABLE A-2. - Transportation cost characteristics of bituminous coal shipped to selected consumers 1/ Continued

To	Origin point or district 2/	Min. train-load tonnages	Min. annual tonnage	Rate per ton in cents Jnct. X-247	Mileage	Rate per ton mile in cents	RR or shipper owned equipment	Tariff reference number 3/	Coal dist.	Average B.T.U. per pound
Iowa										
Burlington	Canton, Ill.	2,000	400,000	136	79	1.501	RR	IB & W 20510-A	10	11,400
		2,000	500,000	134	83	1.277	RR	IB & W 20510-A	10	11,400
		2,000	600,000	134	83	1.253	RR	IB & W 20510-A	10	11,400
Iowana	Lafayette, Ill.	2,500	300,000	164	79	2.760	RR	CBI & P 36735-C	10	11,400
Kansas										
Kansas City	Chelsea, Okla	6,000		126	218	.577	Shipper or company	SWL 22-E	14	12,893
		6,000		195	218	.894	RR		14	12,893
Kentucky										
Louisa	Elkhorn Dist. (Ky.)	6,000		6	42	1.714	RR		8	13,663
Maryland										
Baltimore	Clearfield Dist.	7,000		447	263	1.727	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		409	346	1.196	RR	ICC G-113	2	13,336
	Sauley Dist.	7,000		457	447	1.066	RR	ICC G-113	3	13,400
	Clarksburg Dist.	7,200		461	288	1.601	RR	ICC G-113	3	13,400
Chalk Point	Clearfield Dist.	7,000		448	321	1.387	RR	ICC G-113	1	13,612
	Westmoreland Dist.			481	416	1.156	RR	ICC G-113	2	13,336
	Browntown, W.Va.			416	300	1.387	RR	ICC G-113	3	13,400
Dickerson	Westmoreland Dist.			422	333	1.267	RR	ICC G-113	2	13,336
	Sauley Dist.			440	444	.991	RR	ICC G-113	3	13,400
Lime Kiln	Westmoreland Dist.	7,000		454	334	1.359	RR	ICC G-113	2	13,336
	Sauley Dist.	7,000		472	440	1.061	RR	ICC G-113	3	13,400
Pope Creek	Westmoreland Dist.			469	418	1.122	RR	ICC G-113	2	13,336
	Sauley Dist.			487	439	.421	RR	ICC G-113	3	13,400
Union Bridge	Clearfield Dist.	7,000		406	240	1.692	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		437	321	1.353	RR	ICC G-113	2	13,336
	Sauley Dist.	7,000		457	434	1.053	RR	ICC G-113	3	13,400
Vienna	Clearfield Dist.	7,000		487	356	1.351	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		396	401	.657	RR	ICC G-113	2	13,336
Woodsell	Clearfield Dist.			443	326	1.374	RR	ICC G-113	1	13,612
	Westmoreland Dist.			481	419	1.148	RR	ICC G-113	2	13,336
Massachusetts										
Holyoke	Clearfield Dist.	7,000		583	522	1.117	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		611	654	.427	RR	ICC G-113	2	13,336
	Sauley Dist.	7,000		627	770	.814	RR	ICC G-113	3	13,400
Springfield	Clearfield Dist.	7,000		583	510	1.143	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		612	656	.933	RR	ICC G-113	2	13,336
	Sauley Dist.	7,000		813	767	1.060	RR	ICC G-113	3	13,400
Worcester	Clearfield Dist.	7,000		597	551	1.083	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		625	701	.892	RR	ICC G-113	2	13,336
	Sauley	7,000		643	812	.792	RR	ICC G-113	3	13,400
								ICC G-113		
Michigan										
Belle River	Ohio #8 Dist.	10,000	4,000,000	367	348	1.055	RR	ICC 106	4	12,234
	Ohio #8 Dist.	7,000	10,000,000	469	348	1.405	RR	ICC 106	4	12,234
Detroit	Powhatan, Ohio	8,600		220	288	.764	Shipper or company	PRR 3308-B	4	12,234
	Powhatan, Ohio	8,600		288	310	.929	RR	PC C15-A	4	12,234
	Ohio #8 Dist.	7,000		448	274	1.635	RR		4	12,234
	Ohio #8 Dist.	10,000		236	252	.937	RR		4	12,234
	Sunnyhill, Ohio	8,600		268	276	.976	RR	ICC A-28	4	12,234
	Georgetown, Ohio	8,600		222	315	.705	Shipper	ICC A-28	4	12,234
	Miller, Ohio	8,600		222	306	.725	Shipper	ICC A-28	4	12,234
	Onco, Ohio	8,600		222	330	.673	Shipper	ICC A-28	4	12,234
	Horeb Church, Ohio	8,600		222	231	.961	Shipper	ICC A-28	4	12,234
	Blacksville, W.Va.	8,600		293	395	.742	Shipper	ICC A-28	7	14,040
	Miracle Run, W.Va.	8,600		253	346	.730	Shipper	ICC A-28	7	14,040
	Wana, W.Va.	8,600		293	391	.749	Shipper	ICC A-28	7	14,040
	Jackson, Ohio	10,000		236	272	.868	RR	ICC A-28	4	12,234
								ICC A-25		
Essexville	Freeport, Ohio	9,750	1,000,000	287	357	.804	Shipper or company	B & O C-212	4	12,234
		9,750	1,000,000	374	357	1.048	RR	B & O C-212		
	Triadelphia, W.Va.	7,000	1,000,000	364	412	.883	Shipper	B & O C-212	7	14,040
	Egypt, Ohio	9,750	1,000,000	300	376	.798	Shipper or company	B & O C-212	4	12,234
	Sunnyhill, Ohio	9,750	1,000,000	287	336	.854	Shipper	B & O C-212	4	12,234
	Crooksville	10,000		306	268	.832	RR	B & O C-212	4	12,234
Marysville	Ohio #8	7,000		490	279	1.756	RR		4	12,234
Midland	Powhatan, Ohio	10,000		339	244	1.389	Shipper or company	PC C-3	4	12,234
				388	428	.907	RR		4	12,234
	Ohio Middle Dist.	6,000	900,000	519	329	1.578	RR	ICC 90	4	12,234
Monroe	Blacksville, W.Va.	7,000		178	371	.480	RR	P & LE 375	7	14,040
	Crooksville, Ohio	7,000	10,000,000	377	244	1.545	RR	ICC G-126	4	12,234
Riverview	Ohio #8			446	233	1.428	RR		4	12,234
Trenton	Georgetown, Ohio	7,800		220	306	.719	Shipper or company	PRR 3306-B	4	12,234
	Ohio #8	10,000		236	272	.868	RR		4	12,234
West Olive	Egypt, Ohio	9,750	1,200,000	344	468	.735	Shipper	B & O C-216-A	4	12,234
	Ohio #8	10,000	1,200,000	367	400	.893	RR		4	12,234
Wyandotte	Ohio #8	7,000		448	233	1.421	RR		4	12,234
Minnesota										
Cohasset	Colstrip, Mont.	10,000	400,000	412	789	.522	RR	NP 6161-A	22	10,280
		10,900	1,000,000	353	789	.447	RR		22	10,280
		10,900	1,500,000	321	789	.407	RR		22	10,280
		10,900	1,750,000	307	789	.389	RR		22	10,280
Minneapolis	Harrisburg, Ill.	7,000		464	650	.714	RR	CB & Q 15000-B	10	11,400
		6,000	150,000	480	727	.660	RR	NYC 328	10	11,400
	Southern Ill. Group	10,000		460	640	.719	RR		10	11,400
Northtown	Colstrip, Mont.	7,000	300,000	422	808	.522	RR	NP 6076-A	22	10,280
Missouri										
Kansas	Chelsea, Okla.	6,000		124	218	.569	Shipper or company	SWL 22-E	22	10,280
		6,000		181	218	.830	RR		22	10,280
		6,000	300,000	206	218	.945	RR		22	10,280
Machens	Sesser, Ill.	5,000	1,000,000	179	145	1.234	RR	CB & Q 20504-D	10	11,400
		7,000	1,000,000	151	145	1.041	RR		10	11,400
		7,000	1,000,000	132	145	.910	Shipper		10	11,400
		7,000	2,000,000	125	145	.862	RR		10	11,400
Sibley	Chelsea, Okla.	6,000		168	243	.691	Shipper or company	SWL 22-E	22	10,280
West Labadie	Burning Star Mines	7,000	1,500,000	106	128	.828	RR	MP 183-A	22	10,280
New Hampshire										
Concord	Fairbank, Pa.	9,000	900,000	466	870	.536	Shipper	P & LE 340-B	2	13,196
New Jersey										
Atlantic City	New River (W.Va.)	7,000		578	440	1.314	RR		7	14,040
	Clearfield (Pa.)	7,000		461	372	1.239	RR	ICC G-105	1	13,612
Carneys Pt.	Affinity, W.Va.	7,000		466	482	1.009	RR		7	14,040
Gibbstown	Affinity, W. Va.	7,000		616	582	1.068	RR		7	14,040
	Kanawha Dist.	7,000		548	448	1.196	RR		8	13,663
Gilbert	Kanawha Dist.	7,200		466	520	1.088	RR		8	13,663
	Clearfield Dist.	7,200		449	280	1.604	RR		1	13,612
Penns Grove	Pocahontas	7,200		465	375	1.240	RR		7	14,040

TABLE A-2. - Transportation cost characteristics of bituminous coal shipped to selected consumers 1/ Continued

To	Origin point or district 2/	Min. train-load tonnages	Min. annual tonnage	Rate per ton in cents incl. X-267	Mileage	Rate per ton mile in cents	RR or shipper owned equipment	Tariff reference number 3/	Coal dist.	Average B.T.U. per pound
New York										
Albany	Clearfield Dist.	7,000		499	408	1.223	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		528	543	.972	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		545	654	.833	RR	ICC G-113	3	13,496
								ICC G-113		
Astoria	Kanawha Dist.	10,000		523	532	.983	RR		8	13,663
Broome	Clearfield	7,20		414	224	1.848	RR	ICC G-105	1	13,612
								ICC G-105		
Buffalo	Pittsburgh Dist.	7,000		410	300	1.367	RR	ICC G-105		
	Fairmont Dist.	7,000		430	393	1.094	RR	ICC G-105	2	13,336
	Clearfield Dist.	7,000		410	305	1.344	RR	ICC G-105	1	13,612
	Reynoldsville Dist.	7,000		388	209	1.856	RR	ICC G-105		
Corinth	Clearfield Dist.	7,000		537	434	1.237	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		564	567	.995	RR	ICC G-113	2	13,336
	Gauley	7,000		583	678	.860	RR	ICC G-113	3	13,496
Dresden	Clearfield Dist.	7,000		439	481	.913	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		470	608	.773	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		488	719	.679	RR	ICC G-113	3	13,496
Dunkirk	Fairmont Dist.	7,000		406	335	1.212	RR	ICC G-105	2	13,336
	Butler-Mercer Dist.	7,000		348	147	2.367	RR	ICC G-105	2	13,336
	Reynoldsville Dist.	7,000		344	90	3.822	RR	ICC G-105	1	13,612
	Pittsburgh Dist.	7,000		372	229	1.624	RR	ICC G-105	2	13,336
Glen Falls	Clearfield Dist.	7,000		537	425	1.264	RR	ICC G-105	1	13,612
	Westmoreland Dist.	7,000		564	659	.856	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		583	770	.757	RR	ICC G-113	3	13,496
Johnson City	Clearfield Dist.	7,000		456	261	1.747	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		486	391	1.243	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		503	502	1.002	RR	ICC G-113	3	13,496
Kingston	Clearfield Dist.	7,000		499	386	1.293	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		528	538	.981	RR	ICC G-113	2	13,336
	Gauley	7,000		545	649	.840	RR	ICC G-113	3	13,496
Ludlowville	Clearfield Dist.	7,000		456	360	1.267	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		486	446	1.090	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		503	557	.903	RR	ICC G-113	3	13,496
Oswego	Adelaide, Pa.	7,000	500,000	432	451	.958	RR	ICC G-113	1	13,612
	Clearfield Dist.	7,000		471	340	1.385	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		500	505	.990	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		518	748	.693	RR	ICC G-113	3	13,496
Rochester	Pittsburgh Dist.	7,000		397	376	1.056	RR	ICC G-105		
	Fairmont Dist.	7,000		449	434	1.035	RR	ICC G-105	2	13,336
	Clearfield Dist.	7,000		397	313	1.268	RR	ICC G-105	1	13,612
	Reynoldsville	7,000		410	266	1.541	RR	ICC G-105		
Roseton	Clearfield Dist.	7,000		499	550	.907	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		528	551	.811	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		545	762	.715	RR	ICC G-113	3	13,496
Schenectady	Clearfield Dist.	7,000		499	395	1.263	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		528	528	1.000	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		545	639	.853	RR	ICC G-113	3	13,496
Solvay	Clearfield Dist.	7,000		456	312	1.462	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		486	426	1.141	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		503	537	.937	RR	ICC G-113	3	13,496
Ticonderoga	Clearfield Dist.	7,000		569	480	1.185	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		597	613	.974	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		616	724	.851	RR	ICC G-113	3	13,496
Tomkins Cove	Clearfield Dist.	7,000		499	575	.868	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		528	676	.781	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		545	787	.693	RR	ICC G-113	3	13,496
								ICC G-113		
Torry	Clearfield Dist.	7,200		431	300	1.437	RR		1	13,612
Travis	Clearfield Dist.	7,000		420	397	1.058	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		528	500	1.056	RR	ICC G-113	2	13,336
	Gauley	7,000		643	611	1.052	RR	ICC G-113	3	13,496
								ICC G-113		
North Carolina										
Belmont	Appalachia, Va.	6,130	1,100,000	293	312	.939	RR	SOU 231	8	13,663
		8,600	1,500,000	282	312	.904	RR		8	13,663
		9,800	1,750,000	270	312	.865	RR		8	13,663
	Clinch Valley #2 (Va.)	7,000	1,250,000	301	184	1.636	RR	SOU ICC A11682	8	13,663
Brice	St. Paul, Va.		100,000	401	217	1.848	RR	SFTB 966	8	13,663
			350,000	256	217	1.180	RR		8	13,663
Catawba	Appalachia, Va.	6,130	1,100,000	214	282	.759	RR	SOU 232	8	13,663
		8,600	1,500,000	207	282	.734	RR		8	13,663
		9,800	1,750,000	200	282	.709	RR		8	13,663
Hyco	Banner, Va.	5,000	1,200,000	312	313	.997	RR	N & W 168	8	13,663
		9,000	1,200,000	282	313	.901	RR		8	13,663
Riverbend	Allen, Va.	5,000	1,600,000	340	289	1.176	RR	SFTB 1104	8	13,663
		5,000	2,500,000	332	289	1.149	RR	SFTB 1104	8	13,663
Roxboro	Harris, W.Va.	7,200		278	252	1.103	RR		8	13,663
Terrell	Allen, Va.	5,000	1,600,000	294	304	.955	RR	SFTB 1104	8	13,663
		5,000	2,500,000	282	308	.916	RR	SFTB 1104	8	13,663
Ohio										
Ashtabula	Ohio Middle	3,000		230			RR	ICC G-106	4	12,234
	Ohio #8			274			RR	ICC G-106	4	12,234
Avon Lake	Arnold, Ohio	10,000	2,500,000	187	155	1.206	RR	N & W & C A181	4	12,234
Brilliant	Miller, Ohio	5,000	600,000	98	22	4.455	RR	ICC G-105	4	12,234
	Powhatan, Ohio	5,000	600,000	98	35	2.800	RR	ICC G-105	4	12,234
	Orico, Ohio	5,000	600,000	98	43	2.279	RR	ICC G-105	4	12,234
	Saline ville	5,000	600,000	98	36	2.722	RR	ICC G-105	4	12,234
	Ohio #8	5,000	600,000	98	24	4.083	RR	ICC G-105	4	12,234
	Cadez, Ohio	5,000		32	33		RR	ICC G-105	4	12,234
Celco	Bergholz, Ohio	8,000		214	143	1.497	Company		4	12,234
	Piney Fork, Ohio	8,000		261	165	1.582	Company		4	12,234
Cleveland	Bergholz, Ohio	8,000		208	101	2.059	Company		4	12,234
	Piney Fork, Ohio	8,000		244	120	2.033	Company		4	12,234
	Adena, Ohio	5,000		259			RR		4	12,234
	Cadez, Ohio	5,000		259			RR		4	12,234
Dayton	Ohio #8		850,000	473	250	1.892	RR		4	12,234
	New Lexington, Ohio			352	125	2.816	RR		4	12,234
	Ohio #8			473	262	1.805			4	12,234
Edgewater	Ohio #8	7,000		335	133	2.519	RR		4	12,234
Niles	Moundsville, W.Va.			36	56	.643			6	12,762
Philo	Ohio #8	5,000		115	67	1.716	RR		4	12,234
Springfield	Ohio #8	7,000		422	186	2.269	RR		4	12,234
Toledo	Ohio #8	9,500	720,000	260	188	1.383	RR	N & W A175	4	12,234
	Arnold, Ohio	6,000	800,000	335	201	1.667	RR	ICC 92	4	12,234
	Lexington, Ohio		200,000	383	90	4.256	RR	ICC 92	4	12,234
	Thacker Dist.	9,500	480,000	413	376	1.098	RR	N & W A176	4	12,234
	Ohio Middle	10,000		409	150	2.727	RR	ICC G-115	4	12,234
		10,000		277	196	1.413	RR			
	Kanawha	7,000	480,000	393	360	1.092	RR		8	13,663
Pennsylvania										
Bath	Clearfield Dist.	7,000		456	267	1.708	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		486	421	1.154	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		503	532	.945	RR	ICC G-113	3	13,496
Bridgeport	Clearfield Dist.	7,000		437	263	1.662	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		469	400	1.173	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		487	511	.953	RR	ICC G-113	3	13,496
Eddystone	Clearfield Dist.	7,000		437	276	1.583	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		469	417	1.125	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		487	528	.922	RR	ICC G-113	3	13,496
								ICC G-113		
Erie	Mercer-Butler Dist.			276	88	3.136	RR		2	13,336
Evansville	Clearfield Dist.	7,000		428	232	1.845	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		458	366	1.251	RR	ICC 106	2	13,336
	Gauley Dist.	7,000		478	477	1.002	RR	ICC 106	3	13,496
Hercules	Clearfield Dist.	7,000		456	275	1.658	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		486	421	1.154	RR	ICC 106	2	13,336
	Gauley Dist.	7,000		503	532	.945	RR	ICC 106	3	13,496
Martins Creek	Bakerton, Pa.	10,000		299	339	.882	Shipper or company	ICC 106	2	13,336
	Clearfield Dist.	7,000		456	286	1.594	RR	ICC G-113	1	13,612
	Westmoreland Dist.	7,000		486	437	1.112	RR	ICC G-113	2	13,336
	Gauley Dist.	7,000		503	548	.918	RR		3	13,496

TABLE A-2. - Transportation cost characteristics of bituminous coal shipped to selected consumers 1/ - Continued

To	Origin point or district 2/	Min. train-load tonnages	Min. annual tonnage	Rate per ton in cents incl. F-PUT	Mileage	Rate per ton mile in cents	RR or shipper owned equipment	Tariff reference number 3/	Coal Dist	Average B.T.U. per pound
Pennsylvania (cont.)										
Portland	Clearfield Dist.	7,000		456	275	1.640	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		496	432	1.125	RR	ICC 106	2	13,336
	Cauley Dist.	7,000		509	549	.926	RR	ICC 106	3	13,446
Reading	Clearfield Dist.	7,000		424	222	1.919	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		455	360	1.272	RR	ICC 106	2	13,336
	Cauley Dist.	7,000		479	470	1.017	RR	ICC 106	3	13,446
Saylor	Clearfield Dist.	7,000		446	263	1.734	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		496	400	1.240	RR	ICC 106	2	13,336
	Cauley Dist.	7,000		507	501	1.012	RR	ICC 106	3	13,446
								ICC 106		
Shamokin Dam	Penfield, Pa.	7,000		246	137	1.796	Shipper or	PRR C1/91A	1	11,612
	Cooks Run, Va.	7,000		215	137	1.197	company	PRR A3/927	1	11,612
	Clearfield E.	7,000		249	130	2.000			1	11,612
	Clearfield W.	7,000		308	177	1.864			1	11,612
Siegfried	Clearfield Dist.	7,000		35	294	.119	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		406	401	1.012	RR	ICC 106	2	13,336
	Cauley Dist.	7,000		507	512	.990	RR	ICC 106	3	13,446
Spring Grove	Clearfield Dist.	7,000		368	207	1.780	RR	ICC 106	1	13,612
	Westmoreland Dist.	7,000		437	315	1.387	RR	ICC 106	2	13,336
	Cauley Dist.	7,000		457	426	1.073	RR	ICC 106	3	13,446
Williamsburg	Somerset Dist.								1	13,612
York Haven	Bakerton, Pa.	10,000	1,800,000	218	139	1.568	Shipper or	PRR C-20-B	2	13,336
		10,000	Excess	199	139	1.432	company		2	13,336
	Clearfield Dist.	7,000		406	196	2.183		ICC G-443	1	13,612
	Westmoreland Dist.	7,000		437	299	1.462		ICC G-443	2	13,336
South Carolina										
Beach Island	Jellico Dist.	7,200		522	396	1.318	RR		4	13,663
Canadys	Allen, Va.	5,000	1,500,000	376	516	.729	RR	SFTB 1123	5	13,663
Charleston	Glenbrook, Ky.			522	540	.982	RR		4	13,663
Hartville	Kanawha	7,200		435	550	.791	RR		4	13,663
Irmo	Coalburg, W.Va.	5,000		443	320	1.384	RR		4	13,663
Pelzer	Allen, Va.	5,000	750,000	361	269	1.342	RR	SFTB 1124	4	13,663
Utah										
Geneva	Somerset, Colo.	3,100	1,300,000	310	351	.883	RR	DRGW 7111A	19	9,431
	Columbia, Utah	3,100	1,300,000	195	125	1.521	RR	DRGW 7111A	20	12,610
	Carbondale, Colo.	3,200	350,000	276	360	.767	RR	DRGW 7111B	18	9,431
Vermont										
Burlington	Clearfield Dist.	7,000		625	547	1.143	RR	ICC G-443	1	13,612
	Westmoreland Dist.	7,000		664	662	1.003	RR	ICC G-443	2	13,336
	Cauley Dist.	7,000		684	749	.913	RR		3	13,446
Virginia										
Alexandria	Virginian Dist.	7,200		507	249	2.032	RR		6	13,663
Bremo	New River Group	5,000	2,800,000	417	279	1.495	RR	C & O 250	7	14,340
	Kanawha	7,200		548	396	1.381	RR		6	13,663
Chester	Kanawha	7,200		424	276	1.536	RR		6	13,663
Dumfries	Pocahontas	7,200		151	274	1.208	RR		7	14,340
Glen Lyn	Virginian Dist.	7,200		179	116	1.509	RR		6	13,663
Portsmouth	Pocahontas	7,200		466	348	1.402	RR		7	14,340
Wisconsin										
Oak Creek	Sherwood Dist.	9,000	1,130,000	204	312	.652	RR	C & SW 17162B	10	11,400
		9,000	1,500,000	196	212	.925	RR	C & SW 17162B	10	11,400
	Fulton Co. Ill.	9,000	1,130,000	212	371	.564	RR	C & SW 17162B	10	11,400
		9,000	1,500,000	213	271	.786	RR	C & SW 17162B	10	11,400
	Springfield Dist.	9,000	1,130,000	234	374	.621	RR	C & SW 17162B	10	11,400
		9,000	1,500,000	206	274	.696	RR	C & SW 17162B	10	11,400
	W. Frankfort, Ill.	9,500	1,000,000	275	471	.590	Shipper or	IC 3349	10	11,400
	Vogue, Ky.	9,500	1,000,000	316	627	.504	company	IC 3349	9	12,284
	Nesser, Ill.	9,500	1,000,000	275	436	.630	Shipper or	CB & Q 405.-	10	11,400
Sheboygan	Elm, Ill.	9,500	840,000	179	327	.547	company	CNW 17.71B	-	11,400

1/ Electric utility company consumers represent the largest share of the data. Cement manufacturing consumers are also represented.
2/ Several means of collection of data were used in developing this table. Consequently, the point from which coal was shipped is listed by the location of the tipple, the freight rate district, or the coal field.
3/ Railroad tariff reference numbers are preceded by the initials of the railroad. Interstate Commerce Commission tariff reference numbers are preceded by the initials ICC.

PB-202 167

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15. Supplementary Notes

16. Abstracts

The report delineates some of the important factors relating to the costs of transporting fossil fuels from regions of production to sits of consumption. The costs of shipping coal have been presented in a quantified fashion for selected producing area to areas of consumption. The costs of shipping residual fuel oil and natural gas from domestic and foreign sources to New York and San Francisco Standard Metropolitan Statistical Areas are also provided. The collected transportation data were stratified to determine the general effects stratification had upon transportation costs. Economics of haul for coal do exist for longer versus shorter distances, larger trainload versus smaller trainload sizes, and company-owned car ownership versus railroad car ownership. Most of the rates for the longer voyages for the tanker and barge transportation of residual oil also show economies of haul.

17. Key Words and Document Analysis. 17a. Descriptors

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Natural gas
Residual oils
Cost analysis
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17b. Identifiers/Open-Ended Terms

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